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경영학석사 학위논문

**Why do firms disclose a
Supplementary CEO-Employee Pay
Ratio? Evidence from Dodd-Frank Act
Section 953 (b)**

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Abstract

Why do firms disclose a Supplementary CEO-Employee Pay Ratio? Evidence from Dodd-Frank Act Section 953 (b)

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Section 953 (b) of the Dodd-Frank Act requires all listed firms to disclose a CEO-employee Pay Ratio. Firms are permitted certain discretions in the Pay Ratio calculation and can disclose a Supplementary Pay Ratio if necessary. In this paper, I analyze CEO-employee Pay Ratio data disclosed from January to July 2018 by 1,125 firms in the S&P 1500 Index. I examine whether firms disclose a Supplementary Pay Ratio to inform stakeholders of the Pay Ratio more transparently or to manage stakeholder perceptions of the Pay Ratio. I find evidence consistent with both informational and opportunistic motives driving the Supplementary Pay Ratio disclosure. Furthermore, firms appear to consider two different kinds of political costs—the political costs of disclosing a high Pay Ratio and the political costs of disclosing a supplementary “downward” Pay Ratio. Finally, I find that some firms disclose a Supplementary Pay Ratio higher than the Required Pay Ratio to signal the existence of stronger tournament incentives for labor market considerations.

Keywords: CEO-employee Pay Ratio, Supplementary Pay Ratio, Pay Ratio Disclosure, Disclosure Motives

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I. INTRODUCTION

High vertical pay disparity¹ between executives and employees has become a symbol of corporate greed (*The Guardian* July 17, 2018). It can also create perceptions of unfairness and dissatisfaction among employees, weakening their contribution and commitment (Adams 1965, Festinger 1954, Martin 1981, Pfeffer 2007).² To provide more information about vertical pay disparity and fairness of CEO pay, U.S. Congress enacted Section 953 (b) of the Dodd-Frank Wall Street Reform and Consumer Protection Act of 2010 (“Dodd-Frank Act”, hereafter). According to Section 953 (b), all publicly listed firms are required by the Securities and Exchange Commission (SEC) to disclose a ratio comparing annual CEO compensation with median annual employee compensation, excluding the CEO (“Pay Ratio”, hereafter).

Proponents of Section 953 (b) assert that Pay Ratio information helps investors understand and evaluate CEO compensation practices within a firm-specific context (Crawford et al. 2018, Kelly and Seow 2016). However, critics argue that despite high preparation costs, Pay Ratio information unnecessarily confuses stakeholders in voting or investment decisions (Radford Review 2010, Larcker and Tayan 2011). Given the potential impact of mandated Pay Ratio disclosure on investors and employees, firms would need to provide more economic justifications for their disclosed Pay Ratios (Rouen 2017).

The Final Rule of Section 953 (b) became effective on October 19, 2015

¹ Vertical pay disparity refers to the extent to which the level of pay differs across organizational levels.

² Pfeffer (2007), for example, argues that excessive CEO-employee pay disparity is one of the key causes of distrust between executives and employees.

and has been applicable to firms issuing annual reports since January 2018. The disclosed Pay Ratio informs stakeholders about firm-specific vertical pay disparity unexplained in other executive compensation disclosures, while setting a comprehensive and comparable benchmark to assess a firm's relative distribution of rewards between management and workers. The SEC has attempted to reduce preparation costs for firms by permitting both flexibility in calculating the required main Pay Ratio ("Required Pay Ratio", hereafter) and issuance of a supplementary Pay Ratio ("Supplementary Pay Ratio", hereafter). When calculating the Required Pay Ratio, firms can be flexible, such as choosing the calculation date, excluding a portion of employees, and using reasonable estimates for compensation. The Supplementary Pay Ratio also grants firms a great deal of discretion in that the SEC does not designate a certain calculation method and demands only that firms provide appropriate explanations for the calculation. For example, firms can calculate the Supplementary Pay Ratio based only on employees in the U.S. This is prohibited when calculating the Required Pay Ratio but is permitted for the Supplementary Pay Ratio.

Our paper investigates how and why the Board of Directors utilizes these discretions. Boards are responsible for the Pay Ratio disclosure and have two main motives for the disclosure. On one hand, boards have incentives to provide more accurate Pay Ratio information because the permitted discretions for the Required Pay Ratio are insufficient and could misrepresent firm-specific compensation characteristics. Furthermore, more accurate disclosure would lower the information asymmetry between the firm and stakeholders and benefit the firm in general (Lo 2003, Ferri et al. 2018). On the other hand, boards have incentives to opportunistically manage negative stakeholder perceptions of vertical pay disparity

and CEO pay (Lewellen et al. 1996, Murphy 1996, Yermack 1998, Baker 1999, Laksmana et al. 2012, Hyun et al. 2014). I focus on the Supplementary Pay Ratio disclosure to distinguish between these two motives and examine whether flexibility in Supplementary Pay Ratio disclosure provides useful incremental information for shareholders or is merely a form of impression management employed by boards.³

In addition, I analyze the impact of political costs and signaling motives surrounding the Supplementary Pay Ratio disclosure. Regarding the role of political costs, I distinguish between two kinds of political costs—the political costs of disclosing a high Pay Ratio and the political costs of disclosing an additional (generally “downward”) Pay Ratio. While the former pushes firms to release a lower Supplementary Pay Ratio than the Required Pay Ratio (Hyun et al. 2014), the latter prevents firms from disclosing a Supplementary Pay Ratio at all, for the fear of drawing unnecessary attention to the Supplementary Pay Ratio (Aboody et al. 2004; Hyun et al. 2014).

I also explore the potential signaling motives behind the Supplementary Pay Ratio. Some firms disclose a Supplementary Pay Ratio higher than the Required Pay Ratio, which is inconsistent with the opportunistic motives to mislead stakeholders about the fairness of CEO compensation. Opportunistic incentives would generally drive firms to disclose a lower Supplementary Pay Ratio than the Required Pay Ratio. I explain the seemingly counterintuitive disclosures of these firms with signaling incentives based on labor market considerations, which are distinct from the

³ I only focus on the Supplementary Pay Ratio among the permitted discretions. Since I cannot observe the Pay Ratio before the permitted discretions are applied, it is difficult to discern the intended direction or the magnitude of adjustment. Moreover, stakeholders are likely to rely on the disclosed ‘numbers’ rather than modifying it appropriately due to limited information processing capacity (i.e., functional fixation) (Libby et al. 2002).

informative, opportunistic, and political cost motives.

I collect the Pay Ratio data of 1,125 firms in the S&P 1500 Index that disclose Pay Ratio data in their proxy statements from January to July 2018. In our sample, 14 percent of the firms provide a Supplementary Pay Ratio. Of the subsample of firms disclosing the Supplementary Pay Ratio, 86 percent disclose a Supplementary Pay Ratio lower than the Required Pay Ratio and 14 percent of the subsample disclose a Supplementary Pay Ratio higher than the Required Pay Ratio⁴.

I find evidence consistent with both informational and opportunistic motives for the Supplementary Pay Ratio disclosure. Consistent with the incentives to offer more accurate and transparent information, I find that firms with unique circumstances that are not specified in the permitted discretions are more likely to disclose a Supplementary Ratio. For example, firms with a new CEO, who tends to receive a greater pay (e.g., inducement grants and sign-up bonuses) upon appointment, are more likely to disclose a Supplementary Pay Ratio and disclose a Supplementary Ratio lower than the Required Pay Ratio.

I also find that firms that have stronger incentives to obfuscate, such as firms with greater excess CEO compensation and higher industry-adjusted Required Pay Ratios, are more likely to disclose a Supplementary Pay Ratio and are more likely to disclose a Supplementary Ratio lower than the Required Pay Ratio. The importance of opportunistic motives becomes stronger in explaining the likelihood of providing a Supplementary Pay Ratio lower than the Required Pay Ratio. Furthermore, our findings that firms with less effective boards are more likely to disclose a Supplementary Pay Ratio also becomes stronger in the case of a

⁴ Figure 1 shows that, of the entire sample of firms, 14 percent disclose at least one Supplementary Pay Ratio.

Supplementary Pay Ratio lower than the Required Pay Ratio, suggesting opportunistic motives are more pronounced in disclosing a lower Supplementary Pay Ratio.

Turning to the role of political costs, I find that political costs influence firms' Supplementary Pay Ratio disclosure and this effect differs for the type of political costs. For example, underperforming firms are more likely to disclose a Supplementary Pay Ratio and are more likely to disclose a Supplementary Ratio lower than the Required Pay Ratio. In contrast, larger firms are less likely to disclose a Supplementary Pay Ratio or disclose a Supplementary Ratio lower than the Required Pay Ratio, suggesting that more *visible* (e.g., larger) firms may want to avoid giving the impression that they manipulate stakeholder perceptions of excessive CEO pay through a Supplementary Pay Ratio.

Finally, I find evidence of signaling motives based on labor market considerations for firms disclosing a Supplementary Pay Ratio higher than the Required Pay Ratio. These firms are more likely to have a CEO who is close to retirement and exhibit greater growth opportunities, suggesting that these firms need to signal stronger tournament incentives to the labor market (Siegel and Hambrick 2005, Heyman 2005, Kale et al. 2009, Bebchuk et al. 2011, Faleye et al. 2013). Furthermore, firms that make upward adjustments to the Required Pay Ratio are less likely to have greater excess CEO compensation and greater industry-adjusted Required Pay Ratios. This suggests less opportunistic behaviors for boards that disclose a Supplementary Pay Ratio higher than the Required Pay Ratio.

I also find evidence suggestive of opportunistic motives in the Supplementary Pay Ratio firms when I analyze the market reaction to the announcement of the SEC's final Pay Ratio disclosure rules in 2015 that allowed the

Supplemental Pay Ratio. Despite a general positive market reaction to the announcement of the SEC's final rules, our evidence suggests that actual Supplementary Pay Ratio disclosing firms in 2018 are different from those the market expected to benefit from the lower information asymmetry enabled by the final rules in 2015, consistent with some Supplementary Pay Ratio disclosing firms exploiting this opportunity for opportunistic purposes rather than increasing the informativeness of the Pay Ratio disclosure.

Collectively, our results suggest that Supplementary Pay Ratio disclosure is influenced by both informational motives to provide a more accurate and transparent Pay Ratio and opportunistic motives to manage stakeholder perceptions of pay disparity and CEO pay fairness. Firms appear to consider both political costs and signaling motives in the Supplementary Pay Ratio disclosure. Our market reaction tests provide indirect evidence that Supplementary Pay Ratio disclosure is compromised by firms' opportunistic motives as opposed to informational motives, which the greater flexibility allowed in the SEC's final rules in 2015 intended to promote.

Our study contributes to the literature in the following ways. First, our study sheds light on the recent debate on the usefulness of Pay Ratio disclosure. Critics have questioned the mandatory ratio disclosure because Pay Ratios are heavily impacted by firm characteristics such as firm size, location, and diversification (e.g., Shin et al. 2015, Rouen 2017; Crawford et al. 2018). To address these concerns, the SEC allowed the flexibility in calculating the Required Pay Ratio and issuance of a Supplementary Pay Ratio. I analyze the meaning of subsequent firm disclosure choices in response to the Section 953 (b). I find that boards actively utilize discretions and supplementary disclosure permitted by Section 953 (b) to help

stakeholders assess vertical pay disparity and appropriateness of CEO pay. At the same time, our evidence is also consistent with firms disclosing a lower Supplementary Pay Ratio to manage stakeholder perceptions of pay disparity and fairness of CEO pay. I also add to prior research on the political considerations of firm disclosure practices (Watts and Zimmerman 1986, Healy and Palepu 2001, Aboody et al. 2004). I further provide novel evidence that some firms disclose a Supplementary Pay Ratio higher than the required Ratio to signal strong tournament incentives to the labor market.

Our findings provide timely and relevant evidence on Pay Ratio disclosure to regulators, investors, and other stakeholders. While other permitted adjustments facilitate stakeholder assessment of vertical pay disparity and appropriateness of CEO pay, Supplementary Pay Ratio disclosures are compromised by managerial opportunism. Therefore, I suggest more specific and stricter guidelines for the Supplementary Pay Ratio disclosure.

Second, I extend the literature on executive compensation disclosures. Prior research on executive compensation disclosure has focused on the quality and overall readability of compensation disclosure (Lakshmana 2008, Lakshmana et al. 2012) or the extent of defects by investigating the SEC's non-compliance reviews (Robinson et al. 2011). Using Korean data, Hyun et al. (2014) examine how firms strategically manage the level of executive pay downward and whether managerial self-serving motives play a role in strategic executive pay disclosures. Section 953 (b) itself is a simple mandatory ratio disclosure that uses CEO and employee pay levels as critical inputs, but the flexibility of the Supplementary Pay Ratio provides firms with an opportunity for voluntary disclosure. Our paper extends the literature on executive compensation disclosure by examining unique firm-level pay disparity disclosure

that conveys information not only on executive pay level, but also on internal pay equity, workforce climate, and corporate culture in a setting which combines mandatory and voluntary disclosures (Shin et al. 2015, Rouen 2017).

II. INSTITUTIONAL BACKGROUND

Permitted discretions for Section 953 (b)

Firms subject to Section 953 (b)⁵ must comply with the final rule starting from the fiscal year beginning on or after January 1, 2017. Firms must disclose the ratio of the median of annual employee compensation and the annual CEO compensation. Firms can use largely 7 types of discretions for Pay Ratio disclosure or add a Supplementary Pay Ratio. First, firms can exclude non-U.S. employees that are up to 5% of total employees (*De Minimis Exemption*).⁶ Second, firms can select any date within the last three months of their last completed fiscal year to identify the median employee (*Determination Date*). Third, in determining the median employee, firms can use statistical sampling or other reasonable methods and can substitute another employee with similar compensation for the median employee if the median employee has anomalous compensation characteristics (*Statistical Method*). Fourth, firms can use reasonable estimates to calculate employee compensation and use any compensation measure that is consistently applied to all employees (i.e., payroll records) (Consistently Applied Compensation Measure,

⁵ Emerging growth companies, smaller reporting companies, or foreign private issuers are not subject to the disclosure requirement.

⁶ Firms can exclude non-U.S. employees if it is illegal to transfer the private payroll data of employees out of the country borders (*Foreign Data Privacy Law Exemption*). The 5% limitation on the non-U.S. employee exclusion is applied to the sum of the exclusion number by *Foreign Data Privacy Law Exemption* and *De Minimis Exemption*.

CACM). Fifth, firms can standardize the Pay Ratio for differences in the cost of living between countries. The compensation of employees who live in a different jurisdiction from the CEO can be adjusted for the cost of living in the jurisdiction in which the CEO lives (*Cost of Living Adjustment*). However, if firms adjust for cost of living, firms must also disclose the original Pay Ratio before adjusting for cost of living. Sixth, firms can add certain benefit plans and perquisites that do not exceed \$10,000 when calculating the median employee compensation, as long as CEO compensation is calculated likewise (*Benefit Addition*). The item 402(c)(2)(x) definition of total compensation excludes benefits under non-discriminatory plans, perquisites, and personal benefits that aggregate to less than \$10,000. Employee compensation is likely to be understated if item 402(c)(2)(x) definition of total compensation is applied to employees who are not executives. Lastly, firms can annualize the compensation of permanent employees who are not employed for the entire fiscal year (*Annualization*). These are the 7 types of discretions permitted within the Required Pay Ratio.

Firms are given an additional channel that is a form of voluntary disclosure; firms can choose to disclose an additional Pay Ratio (*Supplementary Pay Ratio*), calculated in whatever method they choose. For example, boards can exclude a one-time payment to the CEO, CEO performance-contingent pay, or non-U.S. employees when calculating the Supplementary Pay Ratio. All these potential adjustments are strictly prohibited when calculating the Required Pay Ratio.

For our study, I classify the total sample firms into three groups (See Figure 1): ‘*No Discretion*’ (Group 1), ‘*Discretion within the Required Pay Ratio*’ (Group 2)⁷,

⁷ ‘*CACM*’ is not included in Group 2. Since many firms do not clearly disclose whether they calculate total employee compensation following item 402 (c)(2)(k) and almost 90 percent

and ‘*Supplementary Pay Ratio Disclosure*’ (Group 3). Firms in Group 1 do not make any adjustments to the Required Pay Ratio or disclose a Supplementary Pay Ratio. Firms in Group 2 are firms that only use the permitted discretions within the Required Pay Ratio and do not disclose any Supplementary Pay Ratios. If firms disclose a Supplementary Pay Ratio, regardless of whether they used the other permitted discretions, they are included in Group 3. Group 3 firms may or may not adjust for the permitted discretions in the Required Pay Ratio⁸. Appendix C provides three representative examples of each group.

III. HYPOTHESES DEVELOPMENT

Pay Ratio disclosure provides information on vertical pay disparity to stakeholders (Shin et al. 2015, Rouen 2017). Economics-based theories such as tournament theory view vertical pay disparity as tournament incentives that provide lower-level employees with stronger motivation and help firm attract and retain talented executives (Lazear and Rosen 1981, Bloom and Michel 2002). Prior research provides empirical evidence that vertical pay disparity has a positive effect on firm performance (Kale et al. 2009, Faleye et al. 2013).

Behavioral theories, however, suggest that large vertical pay disparity leads to fairness concerns, relative deprivation, and resentment among lower-level employees (Cowherd and Levine 1992, Wade et al. 2006). Recent experimental

of firms use the ‘*CACM*’ discretion, I exclude ‘*CACM*’ from Group 2. However, our findings remain qualitatively similar even after adding the ‘*CACM*’ discretion to Group 2.

⁸ The ‘Cost of Living Adjustment’ is included in the ‘Supplementary Pay Ratio’ (Group 3) because the cost of living adjustment also requires firms to disclose the original Pay Ratio without the adjustment. Our results remain qualitatively similar after excluding the ‘*cost of living adjustment*’ from Group 3 (Untabulated).

evidence by Kelly and Seow (2016) suggests that Pay Ratio disclosure provides incremental information to investors by influencing their perceptions of fairness of CEO pay and workplace climate beyond the level of CEO pay. They find that disclosing a higher Pay Ratio in addition to higher CEO pay significantly reduces perceived CEO pay fairness by investors and, in turn, negatively affects their perceived investment potential of the firm.

Recent papers in accounting re-examine the association between pay ratio and firm performance relying on proprietary data or estimates of median employee compensation, due to the lack of publicly available data on firm-level median employee compensation (Cheng et al. 2017, Crawford et al. 2017, Rouen 2017). Rouen (2017) uses confidential establishment-level dataset provided by the U.S. Bureau of Labor Statistics (BLS). Crawford et al. (2017) calculate pay ratio by subtracting the total annual compensation of the CEO from the total compensation expense in the income statement and divide it by the disclosed number of employees minus one⁹. Cheng et al. (2017) uses one-year firm-level compensation data from PayScale.com. Rouen (2017) develops models that distinguish the components of CEO and employee compensation explained or unexplained by economic determinants. He provides evidence that there is a negative (positive) association between the unexplained (explained) part of the pay ratio and firm performance. Crawford et al. (2017) examine whether pay ratio provides useful information for shareholders by showing that voting dissent is significantly higher for firms in the top pay ratio decile. Cheng et al. (2017) document a significantly positive relationship between pay ratio and several firm performance measures.

⁹ The disclosed number of employees usually only contains full-time workers.

Unlike these papers, I am interested in examining firms' motives in exploiting the discretions allowed in the SEC's Pay Ratio disclosure regulations and utilize large sample data that is newly available due to the regulation. Building on the ongoing debate on whether managers disclose non-GAAP earnings to inform or mislead (See Black et al. 2018 for a review of non-GAAP earnings literature), I argue that boards have two competing incentives for disclosing the Supplementary Pay Ratio.

Firms have informational incentives to provide more information about the Pay Ratio primarily because the permitted discretions do not fully reflect the breadth of firm-specific compensation practices. Firms can provide more accurate information through the Supplementary Pay Ratio, such as unique business operations or compensation items. Investors can utilize the additional information to accurately assess a firm's workforce environment and fairness of CEO pay. Prior literature also finds that firms benefit from disclosures that reduce the information asymmetry between shareholders and the firm (Lo 2003, Ferri et al. 2018). Ferri et al. (2018) show that the SEC's new executive compensation disclosure rules in 2006 decrease investor uncertainty about reporting incentives of managers and thus increase the firms' earnings response coefficient (ERC).

A representative example of firms with strong informational motives would be firms with many foreign segments. Firms with many foreign segments must include foreign employee compensation for the Required Pay Ratio, but the dollar value of non-U.S. employee compensation is much lower than that of U.S. employee compensation. Since boards can exclude foreign employees only up to 5 percent of total employees, boards cannot fully reflect firm-specific employee composition in the Required Pay Ratio if the portion of foreign employees exceed the 5 percent limit.

Another example of firms with considerable informational motives would be firms that hired new CEOs during the sample year. Newly hired CEOs are paid extraordinary items such as signing bonuses and inducement grants. Also, they occasionally defer or forgo their compensation of the very year they get hired based on the agreement. Boards cannot arbitrarily exclude items that do not represent regular compensation from the Required Pay Ratio or include items that the CEOs would have been paid if they had not forgone their compensation. Thus, they would be inclined to communicate these well-known and transitory items to shareholders through the Supplementary Ratio. Based on these arguments, I propose the following hypothesis.

H1: Supplementary Pay Ratio disclosure is related to informational motives of boards. Specifically, Supplementary Pay Ratio disclosure is positively associated with the number of firms' foreign segments and a new CEO.

Boards can also have opportunistic motives for disclosing a Supplementary Pay Ratio. Boards can utilize the greater discretion given in the Supplementary Pay Ratio to present the Pay Ratio in a more favorable light. This generally results in a lower Supplementary Ratio than the Required Ratio. Prior research finds that CEOs address stakeholder criticism on executive compensation by managing proxy disclosures (Lewellen et al. 1996, Murphy 1996, Yermack 1998, Baker 1999). In a similar context, boards could also manage stakeholder perceptions of vertical pay disparity by providing a Supplementary Pay Ratio. Boards often face criticism for overpaying the CEO. If the executive compensation package is excessive, boards could try to play down the excessive pay disparity between the CEO and employees through a Supplementary Ratio. Robinson et al. (2011) document similar evidence in that non-compliance to the mandatory compensation disclosure rule of 2006 is positively associated with excess CEO compensation. In line with Robinson et al.

(2011), I posit that the level of excess CEO compensation, defined as the portion of total CEO compensation unexplained by economic determinants, is positively associated with the firm's disclosure of a Supplementary Pay Ratio.

Furthermore, investors' perception of Pay Ratios affects their perception of firm investment opportunities. Kelly and Seow (2016) find that investors determine how unfair CEO pay or workforce environment is by comparing the focal firm's Pay Ratio with the industry median Pay Ratio. Section 953 (b) enables shareholders to easily access and compare pay ratios across firms in the industry. Therefore, I expect the opportunistic motives of boards to increase as the firm's Required Ratio exceeds the industry median Required Ratio. I predict the following hypothesis:

H2: Supplementary Pay Ratio disclosure is positively associated with opportunistic motives. Specifically, Supplementary Pay Ratio disclosure is positively associated with excess CEO compensation and higher industry-adjusted Required Pay Ratios.

Positive accounting theory underscores the role of political factors in firms' reporting choices (Watts and Zimmerman 1986, Healy and Palepu 2001; Aboody et al. 2004). Exorbitant Pay Ratios could generate public fury and negative reactions from stakeholders. In the face of offshoring of jobs and mass layoffs, dramatically high CEO-employee pay ratios have led to severe criticisms on fairness of executive compensation (Matsumura and Shin 2005). These concerns would be more pronounced among firms with greater political costs of disclosing a high Pay Ratio, such as highly unionized firms, firms in the Consumer Goods Industry, or firms with poor performance. I expect these firms with higher political costs to be more likely to disclose a Supplemental Pay Ratio and especially a Supplementary Pay Ratio lower than the Required Pay Ratio. Boards are likely to be more sensitive to employee satisfaction in firms with higher labor unionization rates. Given the public

outrage of exorbitant pay ratios, consumers could also generate significant political costs in disclosing a high Pay Ratio. Mohan et al. (2015) document that the perceived wage fairness represented by a firm's Pay Ratio influences the purchase intentions of individual consumers, suggesting that consumers may prefer firms with a lower CEO-employee Pay Ratio.

Firm performance and leverage may also affect the political costs of disclosing a high Pay Ratio (Eng and Mak 2003, Hyun et al. 2014). High CEO-employee pay ratios in the face of poor firm performance would trigger outrage from stakeholders. Thus, poorly performing firms have greater incentives to manage stakeholder perceptions of vertical pay disparity and CEO pay fairness to avoid being criticized for 'pay-for-failure'. Highly leveraged firms could also be concerned about debtholder response to a high Pay Ratio. Taken together, firms with high political costs of disclosing a higher Pay Ratio are more likely to disclose a Supplementary Pay Ratio.

On the other hand, disclosing a supplementary pay ratio may draw unnecessary attention, especially for more visible firms on which negative media coverage of CEO pay is focused (Core et al. 2008). For these firms, the perceived political costs of disclosing an additional Pay Ratio may be larger than the benefits from disclosing a lower Supplementary Ratio (Aboody et al. 2004).

I predict the following hypothesis:

H3: Supplementary Pay Ratio disclosure is positively (negatively) associated with the degree of political costs of disclosing a high level of Pay Ratio (an additional Pay Ratio).

Some firms disclose Supplementary Pay Ratios higher than the Required Pay Ratio. If boards wanted to mislead stakeholders on the income distribution, they would naturally want to make downward adjustments to the Required Pay Ratio.

Thus, I hypothesize that firms that provide a Supplementary Pay Ratio higher than the Required Pay Ratio have different motives from firms that disclose Supplementary Ratios lower than the Required Pay Ratio.

First, a higher Supplementary Pay Ratio could signal larger tournament incentives to attract and retain highly motivated and entrepreneurial executives and employees (Bloom and Michel 2002, Kale et al. 2009, Kelly and Seow 2016). For example, Kale et al. (2009) document that tournament incentives are more beneficial in driving firm performance when the incumbent CEO is close to retirement. Bloom and Michel (2002) argue that firms with high growth opportunities use a more dispersed pay structure because they need to attract and retain more skillful and motivated managers who can continuously identify growth opportunities. Second, due to the evident lack of opportunistic incentives, firms disclosing a higher supplementary ratio could signal their sincere commitment to more accurate and transparent pay disclosure to stakeholders (Aboody et al. 2004; Curtis et al. 2014). Third, these firms could have lower costs for disclosing a higher supplementary ratio because CEO compensation and vertical pay disparity are lower than their peers.

I focus on firms with greater signaling motives for labor market considerations. Firms that are more active in the labor market are more likely to reap benefits from signaling stronger tournament incentives and hence disclose a higher Supplementary Pay Ratio. I predict the following hypothesis:

H4: Disclosing a Supplementary Pay Ratio higher than the Required Pay Ratio is positively associated with signaling motives for labor market considerations. Specifically, the disclosure of a Supplementary Pay Ratio higher than the Required Pay Ratio is more likely when incumbent CEO nears retirement and firms have greater growth opportunities.

IV. SAMPLE AND VARIABLES

Sample Selection

I manually collect Pay Ratio information of S&P 1500 firms disclosed in proxy statements from January to July 2018. The initial sample consists of 1,168 firms. I collect board characteristics directly from proxy statements. I obtain stock price data from CRSP and financial data from Compustat. Labor unionization rate data is taken from the Union Membership and Coverage Database. Management earnings forecast data is taken from I/B/E/S. Firms missing necessary data are removed from the final sample. Our final sample consists of 1,125 firms. All continuous variables are winsorized at the top and bottom one percentile. Figure 1 Panel A illustrates our sample selection process. Appendix D provides variable definitions.

Variable Measurement

Discretions in the Pay Ratio Disclosure

I divide the type of permitted discretions into two groups: ‘Discretion within the Required Pay Ratio¹⁰’ and ‘Supplementary Pay Ratio’. For further analysis, the ‘Supplementary Pay Ratio’ group is then divided into ‘Lower Supplementary Pay Ratio’ firms and ‘Higher Supplementary Pay Ratio’ firms. Since firms can adjust the Required Pay Ratio and simultaneously provide a Supplementary Pay Ratio, I define the variable *Supplementary Pay Ratio Disclosure*

¹⁰ As mentioned in the previous section, I exclude ‘CACM’ from the ‘Discretion within the Required Pay Ratio’ group.

as having a value of 1 if the firm discloses a Supplementary Pay Ratio¹¹ regardless of whether other adjustments are made, and 0 otherwise. I also define the variable *Higher (Lower) Supplementary Pay Ratio Disclosure* as having a value of 1 if the disclosed Supplementary Pay Ratios are higher (lower) than the Required Pay Ratio.¹²

(FIGURE 1 HERE)

Proxies for Informative Motives

I use two variables to measure the informative motives of firms to disclose a Supplementary Pay Ratio. First, I identify the number of foreign segments from the Compustat Segment database. I manually collect segment information of firms that are not matched with the Compustat database. I define the variable *Foreign Segment* as the natural logarithm of the number of total geographical segments.¹³ *Foreign Segment* has a value of 0 if the firm has only U.S segments. I use the natural logarithm because the distribution of the foreign segment variable is skewed. The second proxy for informative motives is *New_CEO* that has a value of 1 if a new CEO was hired in 2017. *New_CEO* represents firm's incentives to account for

¹¹ I also include the cost of living adjustment because when firms adjust for cost of living, they must disclose both ratios for before and after the adjustment.

¹² Out of the 155 firms that disclose at least one supplementary pay ratio, 18 firms (11.6 percent) provide multiple supplementary pay ratios. For these firms, *Higher (Lower) Supplementary Pay Ratio Disclosure* has a value of 1 if all the Supplementary Pay Ratios are higher (lower) than the Required Pay Ratio. The reported results in the next section are qualitatively similar when a broader definition is applied (e.g., *Higher (Lower) Supplementary Pay Ratio Disclosure* has a value of 1 if at least one of the Supplementary Pay Ratios is higher (lower) than the Required Pay Ratio). When firms provide multiple Supplementary Pay Ratios, I use the mean value of disclosed Supplementary Pay Ratios when calculating *Percent_Adjustment*.

¹³ All of our results are similar when I replace *Foreign Segment* with the proportion of sales revenue from foreign segments.

temporary fluctuation in CEO compensation.

Proxies for Opportunistic Motives

To capture the opportunistic motives of firms for disclosing a Supplementary Pay Ratio, I first calculate *Excess_Comp* following Core et al. (2008) and Robinson et al. (2011). I estimate expected compensation by regressing total CEO compensation on the economic determinants of CEO compensation based on the following regression model.

$$\begin{aligned} \text{Log}(\text{Compensation})_i = & \alpha_0 + \alpha_1 \text{Log}(\text{tenure})_i + \alpha_2 S\&P500 + \alpha_3 \text{Log}(\text{Sales})_i + \alpha_4 BM_i \\ & + \alpha_5 RET_i + \alpha_6 \text{LagRet}_i + \alpha_7 ROA_i + \alpha_8 \text{LagROA}_i + u_i \end{aligned}$$

, where *Compensation* is the total CEO compensation of firm *i* for 2017.

The residual component of the CEO compensation, *Excess_Comp*, is then calculated by subtracting expected compensation from total compensation paid to the CEO. Our second measure for capturing opportunistic motives is *Industry-adjusted Required Pay Ratio*, defined as Required Pay Ratio minus Industry Median Ratio divided by Industry Median Ratio. I calculate *Industry-adjusted Required Pay Ratio* based on Fama-French 48 Industry Classifications.

Proxies for Political Costs

To capture the political costs associated with Pay Ratio disclosure, I use five measures. I use the labor unionization rate of a firm (*Unionization*) as a proxy for political costs incurred from employees for disclosing a higher Pay Ratio. I utilize the industrial unionization rate from the Union Membership and Coverage Database.¹⁴ I also include an indicator variable for Consumer Goods and Services industries (e.g., B2C industries as opposed to B2B industries) to capture the political

¹⁴ The Union Membership and Coverage Database can be accessed at www.unionstats.com. U.S. firms are not mandated to disclose their labor unionization rate.

costs of consumers (*Consumer_Goods_Industry*). I assign a value of 1 if the firm SIC classification falls into Consumer Goods Industry defined in Sharpe (1982) and Thomas (1989), and 0 otherwise. Annual stock returns of firms (*Stock_Return*) account for the political costs of poorly performing firms. *Leverage*, the book value of liabilities divided by the book value of assets, incorporates political costs from debtholders.

As for the second type of political costs, I use firm size as a proxy for firm visibility based on prior research that finds larger firms are subject to more public and regulatory scrutiny (Bannister and Newman 2003, Aboody et al 2004, Gong et al. 2011, Hyun et al. 2014). I use the natural logarithm of firms' total assets (*Size*) as a measure of firm size.

Proxies for Signaling Incentives to the Labor Market

I follow prior studies on tournament incentives (Bloom and Michel 2002, Kale et al. 2009, Shin et al. 2015). Following Biddle et al. (2009), I use the market value to the book value of total assets (*Market_to_Book*) as a proxy for investment opportunities. For additional labor market considerations such as CEO succession, I use an indicator variable *Close_to_Retire*, which equals to one if a firm's CEO is 62 or older, to capture the approaching retirement of the CEO (Huang et al. 2012, Shivdasani and Yermack 1999).

Proxies for the Effectiveness of Boards

Board characteristics, such as board size, board meeting frequency, and board independence, are related to the quality of executive compensation disclosure or the level of disclosure defects after the new 2006 executive compensation disclosure rules (Laksmana 2008, Robinson et al. 2011). Using Korean data, Hyun et al. (2014) find that firms with higher board independence are less likely to

strategically manage the disclosure of director pay. In our setting, I expect effective and well-governed boards to successfully refrain from opportunistic Supplementary Pay Ratio disclosures. To operationalize the effectiveness of the board, I measure the number of directors on the board (*Board Size*), frequency of board meetings (*Board Meeting*), and percentage of independent directors (*Board Independence*).

Control Variables

I control for several factors that are likely to influence voluntary disclosure of a Supplementary Pay Ratio. Proprietary costs play a key role in voluntary disclosure (Dye 2001, Verrecchia 2001). More accurate Pay Ratio disclosures could harm the labor market competitiveness of firms by revealing proprietary information about internal compensation practices. I follow prior research (e.g., Harris 1998, Robinson et al. 2011, Hyun et al. 2014) and use industry-level concentration, the Herfindahl-Hirschman Index of the firm's market share of industry, as a proxy for proprietary costs. I use the one minus Herfindahl-Hirschman Index (*Competition*) for easier interpretation of results.

I also control for the overall disclosure quality of a firm. Firms with higher overall disclosure quality could be committed to providing more accurate and transparent disclosure to reduce information asymmetry and thus are more likely to provide detailed information about their Pay Ratios by disclosing Supplementary Pay Ratio. Following prior literature (e.g., Ajinkya et al. 2005, Karamanou and Vafeas 2005), I use the frequency of management earnings forecasts (*Disclosure Quality*) in the fiscal year of 2017 as a proxy for overall disclosure quality.

Institutional investors are also known to affect firm disclosure decisions. Boone and White (2015) provide evidence that higher institutional ownership leads to greater management disclosure. Robinson et al. (2011) document that higher

institutional ownership is negatively associated with the extent of compensation disclosure defects. I construct a measure of institutional ownership as the percentage of total shares outstanding held by top 5 institutional investors (*Institutional Ownership*).

Descriptive Statistics

Panel A of Figure 1 shows that the majority (85 percent) of firms use at least one discretion in providing the Pay Ratio disclosure (*Using Discretion = 1*), suggesting that firms are actively utilizing the permitted discretions even in the first year of Section 953 (b). Among the firms that use discretions, about 16 percent (14 percent in full sample) provide at least one Supplementary Pay Ratio (*Supplementary Ratio Disclosure = 1*). About 14 percent (2 percent in full sample) of the subsample of firms providing supplementary ratio discloses a Supplementary Ratio greater than the Required Pay Ratio (*Higher Supplementary Ratio Disclosure = 1*).¹⁵

Panel B of Figure 2 presents the percentage of firms that use each type of permitted discretion. The majority of firms (89.2%) use CACM in the calculation of the required Pay Ratio. About half of firms (50.5%) use ‘*Annualization*’ in the calculation of the Required Pay Ratio. ‘*Determination Date*’ (45.3%) and ‘*De Minimis Exemption*’ (30.8%) are the next frequently exploited discretions. Interestingly, very few firms (1%) reflect the difference of the cost of living between the CEO and the median employee in their required Pay Ratio (*Cost of Living Adjustment*). Moreover, among the firms that disclose Supplementary Pay Ratios,

¹⁵ Figure 1 shows that, of the entire sample of firms, 14 percent disclose at least one Supplementary Pay Ratio, and 2 percent disclose a Supplementary Pay Ratio higher than the Required Pay Ratio.

71.6% of these firms adjust the CEO total compensation while 43.3% of Supplemental Pay Ratio firms modify the median employee compensation in calculating the Supplementary Pay Ratio.

Table 1 provides the descriptive statistics of the sample. The mean and median Pay Ratios are 191.51 and 94, respectively, implying a skewed Pay Ratio distribution. The mean (median) Pay Ratio in the subsample of firms disclosing a Supplementary Pay Ratio is significantly higher than that in the total sample of firms, at 354.82 (156). The Supplementary Pay Ratios disclosed by firms are substantially lower than the Required Pay Ratio. The mean (median) value of the disclosed Supplementary Pay Ratios is 156.22 (98), which is much lower than the Required Pay Ratio. However, 14 percent of the firms that disclose Supplementary Pay Ratios provide a Supplementary Ratio higher than the Required Ratio. For firms with a higher Supplementary Pay Ratio, the mean (median) Supplementary Pay Ratio is 178.99 (130), compared to the mean (median) Required Pay Ratio of 98.08 (72).

Table 2 presents the Pearson correlation between the key variables. Consistent with H1 and H2, the likelihood of disclosing a Supplementary Pay Ratio is positively correlated with a new CEO, the logarithm of the number of geographical segments, the industry-adjusted Required Pay ratio, and excess CEO compensation.

(TABLE 1 HERE)

(TABLE 2 HERE)

V. RESEARCH DESIGN & EMPIRICAL RESULTS

To examine boards' motives behind the Supplementary Pay Ratio disclosure (H1 and H2), I employ the following Probit regression model with robust standard errors.

$$\begin{aligned} & \text{Prob}(\text{Supplementary Ratio Disclosure}=1)_i \\ & \text{or Prob}(\text{Lower Supplementary Ratio Disclosure})=1)_i \\ & = \beta_0 + \beta_1 \text{New_CEO}_i + \beta_2 \text{Foreign_Segment}_i \\ & + \beta_3 \text{Ind_Adj_Pay_Ratio}_i + \beta_4 \text{Excess_Comp}_i + \beta_5 \text{Unionization}_i \\ & + \beta_6 \text{Consumer_Goods_Industry}_i + \beta_7 \text{Stock_Return}_i + \beta_8 \text{Size}_i \\ & + \beta_9 \text{Leverage}_i + \beta_{10} \text{Board_Size}_i + \beta_{11} \text{Board_Meeting}_i \\ & + \beta_{12} \text{Board_Independence}_i + \beta_{13} \text{Competition}_i \\ & + \beta_{14} \text{Disclosure_Quality}_i + \beta_{15} \text{Institutional_Ownership}_i + u_i \end{aligned} \quad (1)$$

The first dependent variable in Equation (1) is an indicator variable which takes the value of 1 if firm i discloses (at least one) Supplementary Pay Ratio, regardless of whether the Supplementary Pay Ratio is higher or lower than the Required Pay Ratio. The disclosed Supplementary Pay Ratio is often lower than the Required Pay Ratio (86 percent of Supplementary Pay Ratio firms). I use the second dependent variable, *Lower Supplementary Ratio Disclosure*, an indicator variable which equals 1 if the Supplementary Pay Ratio is lower than the Required Pay Ratio or 0 otherwise. *New_CEO* and *Foreign_Segment* represent the firm's motives to inform stakeholders. *Excess_Comp* and *Ind_Adj_Pay_Ratio* represent the firm's motives to manage stakeholder perception of vertical pay disparity and internal pay equity.

To examine the board's motives behind the disclosure of the Supplementary Pay Ratio higher than the Required Pay Ratio, I estimate the following Probit

regression model. The dependent variable in Equation (2), *Higher Supplementary Ratio Disclosure*, is an indicator variable which equals 1 when firm i discloses a Supplementary Pay Ratio higher than the Required Pay Ratio, and 0 otherwise.¹⁶¹⁷

$$\begin{aligned}
 \text{Prob}(\text{Higher Supplementary Ratio Disclosure}=1)_i &= \beta_0 + \beta_1 \text{New_CEO}_i + \beta_2 \text{Foreign_Segment}_i \\
 &+ \beta_3 \text{Ind_Adj_Pay_Ratio}_i + \beta_4 \text{Excess_Comp}_i \\
 &+ \beta_5 \text{Unionization}_i + \beta_6 \text{Consumer_Goods_Industry}_i \\
 &+ \beta_7 \text{Stock_Return}_i + \beta_8 \text{Size}_i + \beta_9 \text{Leverage}_i + \beta_{10} \text{Close_to_Retire}_i \\
 &+ \beta_{11} \text{Book_to_Market}_i + \beta_{12} \text{Board_Size}_i + \beta_{13} \text{Board_Meeting}_i \\
 &+ \beta_{14} \text{Board_Independence}_i + \beta_{15} \text{Competition}_i \\
 &+ \beta_{16} \text{Disclosure_Quality}_i + \beta_{17} \text{Institutional_Ownership}_i + u_i
 \end{aligned}
 \tag{2}$$

(TABLE 3 HERE)

Given the small proportion of firms that disclose a higher Supplementary Pay Ratio, the coefficients from estimating Equation (2) using general binary dependent variable regressions (e.g., logit or probit) could be biased and inefficient (Owen 2007). To address this concern, I employ the Firth (1993) logistic regression model (i.e., penalized likelihood regression) to reduce the bias in maximum likelihood estimates of coefficients (Firth 1993).

Table 3 reports the Probit estimation results of Equation (1). Columns (1) and (2) present the results based on the entire sample of firms. Columns (3) and (4) present the results based on a subsample of firms that use at least one discretion in

¹⁶ To address the concern that the CEO transition is mechanically associated with higher excessive compensation and higher industry-adjusted pay ratio, I exclude firms where a new CEO is hired during the fiscal year of 2017 and re-estimate Equation (1). I continue to find significantly positive coefficients on *Ind_Adj_Pay_Ratio* and *Excess_Comp* (untabulated).

¹⁷ Our results in Table 3 are unchanged when I replace *Consumer_Goods_Industry* with industry indicator variables to control for industry-fixed effects (untabulated).

the Pay Ratio disclosure. The dependent variable for Columns (1) and (3) is *Prob (Supplementary Ratio Disclosure = 1)*; the dependent variable for Columns (2) and (4) is *Prob (Lower Supplementary Ratio Disclosure = 1)*. The results based on the entire sample are very similar to those based on the subsample of firms that use at least one discretion. Therefore, I only discuss the results based on the total sample.

In Column (1), the coefficient on *New_CEO* is positive and significant ($\beta_1=0.496$, $p<0.01$). The coefficient on *Foreign_Segment* is also positive and significant ($\beta_2=0.098$, $p<0.1$). These results indicate that firms are more likely to disclose a Supplementary Pay Ratio when there is a greater need to help stakeholders assess the vertical pay disparity of the firm. The results are consistent with Supplementary Pay Ratios providing stakeholders with more accurate information on firm-specific compensation practices, such as extraordinary compensation of new CEOs or firm-specific employee composition, such as geographical dispersion. This finding lends support to the informational motives of boards for Supplementary Pay Ratio disclosure (H1).

In line with H2, the coefficient on *Ind_Adj_Pay_Ratio* is positive and significant ($\beta_3=0.193$, $p<0.01$). The coefficient on *Excess_Comp* is also positive and significant ($\beta_4=0.248$, $p<0.05$). These results indicate that firms are more likely to disclose a Supplementary Pay Ratio when boards perceive a greater need to assuage stakeholder concerns about excessive CEO pay and vertical pay disparity. Consistent with our prediction in H3, I find negative and significant coefficients on *Stock_Return* and *Size*. Given poor stock price performance, boards are more likely to disclose a Supplementary Pay Ratio to avoid being blamed for ‘paying-for-failure’. By contrast, boards of more visible firms are less likely to disclose a Supplementary Pay Ratio.

I find little evidence that proprietary costs play a role in firms' Supplementary Pay Ratio disclosure as proven by the insignificant coefficient on *Competition*. The significantly positive coefficient on *Disclosure_Quality* indicates that firms with higher disclosure quality are more likely to disclose Supplementary Pay Ratios to reduce information asymmetry, supporting the informative motives of boards. I find little evidence that the concentration of institutional investor holdings is associated with boards' Supplementary Pay Ratio disclosure.

In Column (2), where the dependent variable is *Prob (Lower Supplementary Ratio Disclosure=1)*, the coefficients on *New_CEO*, *Ind_Adj_Pay_Ratio*, and *Excess_Comp* continue to be positive and significant, consistent with the results of Column (1). Note that the coefficient on *Excess_Comp* is now significant at the 1 percent level in Column (2), compared to significance at the 5 percent level in Column (1). The coefficients on *Stock_Return* and *Size* remain negative and significant as in Column (1). Overall, I find evidence that boards have both informational and opportunistic motives to disclose a Supplementary Pay Ratio lower than the Required Pay Ratio. Both types of political costs also influence the disclosure of a Supplementary Pay Ratio lower than the Required Pay Ratio. Interestingly, the significantly positive coefficient on *Disclosure_Quality* in Column (1) loses its significance in Column (2).

Turning to the effect of board effectiveness, although the coefficients on *Board_Independence* are significantly negative in both columns, I find that the coefficient in Column (2) is significantly more negative than that in Column (1) (diff=0.364, p=0.054), suggesting that boards play a greater role in constraining the disclosure of a Supplementary Pay Ratio lower than the Required Pay Ratio. This finding is consistent with prior research that documents the positive effect of board

effectiveness on the quality of executive compensation disclosures (Laksmana 2008; Hyun et al. 2014). I also compare the coefficients on our proxies for opportunistic motives, *Ind_Adj_Pay_Ratio* (diff=-0.038, $p<.0001$) and *Excess_Comp* (diff=-0.214, $p<.0001$) between Columns (1) and (2), and find that our proxies for opportunistic motives are more closely associated with the disclosure of a Supplementary Pay Ratio lower than the Required Pay Ratio than the disclosure of a Supplementary Pay Ratio. Collectively, our results suggest that opportunistic motives are more salient in disclosing a *lower* Supplementary Pay Ratio than in disclosing a Supplementary Pay Ratio (i.e., disclosing lower Supplementary Pay Ratio assuages shareholders' concerns about the fairness of CEO pay more effectively).

(TABLE 4 HERE)

Table 4 shows the estimation results of Equation (2), which uses *Higher Supplementary Ratio Disclosure* as the dependent variable. Column (1) is based on the entire sample and Column (2) is based on the subsample of firms that use at least one discretion in the Pay Ratio. Again, our results based on the entire sample are very similar to those based on the subsample of firms using at least one discretion; therefore, I only discuss our results based on the total sample.

In both Columns (1) and (2), the coefficient on *New_CEO* is positive and significant at the 5 percent level, while the coefficient on *Foreign_Segment* is positive and weakly significant at the 10 percent level. This evidence suggests that informative motives continue to be important in explaining the disclosure choice of a higher Supplementary Pay Ratio, consistent with H1. The significantly negative

coefficients on *Ind_Adj_Pay_Ratio* and *Excess_Comp* in both columns indicate that these firms have lower excess CEO pay and less vertical pay disparity compared to their peers and thus the cost of providing a higher Supplementary Pay Ratio would be lower. The coefficients on *Board_Size* and *Board_Independence* are positive and significant in both columns¹⁸, suggesting that the effectiveness of boards also plays a role in boards' decision to disclose a higher Supplementary Pay Ratio. The coefficients on our proxies for political costs, however, are insignificant except for the coefficient on *Consumer_Goods_Industry* in Column (2). The significantly positive coefficient on *Disclosure_Quality* indicates that firms could disclose a higher Supplementary Ratio to send a credible signal of their commitment to more accurate and transparent pay disclosure to stakeholders because of the evident lack of opportunistic incentives.

Consistent with H4, the coefficients on *Close_to_Retire* and *Market_to_Book* are positive and significant at the 5 percent level in both columns, lending support to the notion that firms potentially disclose a higher Supplementary Pay Ratio to signal strong tournament-based incentives for labor market considerations. In other words, boards of firms whose CEOs are approaching retirement will reap benefits from signaling sizable tournament prizes to attract and retain high caliber candidates¹⁹. Moreover, to the extent that the firm has greater

¹⁸ Prior studies show mixed evidence of the role of board size in firms' corporate governance. For instance, Yermack (1996) reports a negative relation between board size and firm valuation, while Jensen (1993) and Lipton and Lorsch (1992) suggest a positive relation. Prior studies examining the effect of board characteristics on the quality of executive compensation disclosure find that the quality of executive compensation disclosure increases with board size (Laksmanna 2008; Hyun et al. 2014).

¹⁹ Out of 21 firms that disclose a Supplementary Pay Ratio higher than the Required Pay Ratio, 17 firms (81%) modify the total compensation of CEOs (e.g., annualizing LTIP over relevant periods to reflect upfront-loaded amounts). This suggests that these firms mainly attempt to convey information about CEO compensation, not employee compensation.

growth opportunities, the board could emphasize tournament incentives to attract highly motivated and competent employees. Taken together, our findings support that the necessity of signaling larger vertical pay disparity due to labor market considerations contributes to the firm's choice to disclose a Supplementary Pay Ratio higher than the Required Pay Ratio.

VI. ADDITIONAL ANALYSES

Alternative Dependent Variable

In preceding analyses, I use an indicator variable of whether or not the firm discloses a Supplementary Pay Ratio (or a Supplementary Pay Ratio higher or lower than the Required Pay Ratio). To check the robustness of our results, I use an alternative continuous dependent variable, *Percent_Adjustment*. *Percent_Adjustment* measures the magnitude of the Supplementary Pay Ratio adjustment from the Required Pay Ratio; the percentage deviation of Supplementary Pay Ratio from the Required Pay Ratio. In Table 5 Column (1), *Abs_Percent_Adjustment*, the absolute value of *Percent_Adjustment*, is used as a dependent variable to capture the *magnitude* of adjustment regardless of the *direction* of adjustment. *Abs_Percent_Adjustment_i* equals 0 when firm *i* does not disclose a Supplementary Pay Ratio. In Column (2) (Column (3)), I use the magnitude of downward (upward) adjustment, *Downward_Percent_Adjustment_i* (*Upward_Percent_Adjustment_i*), which equals to *Percent_Adjustment_i* but only when the Supplementary Pay Ratio is lower (higher) than the Required Pay Ratio and

equals 0 otherwise. I estimate Tobit regressions for Columns (1), (2), and (3).²⁰

(TABLE 5 HERE)

The results in Table 5 are largely consistent with those of previous analyses in Tables 3 and Table 4. For example, in Columns (1), (2) and (3) of Table 5, the coefficients on *New_CEO* are positively significant. In Columns (1) and (3), the coefficients on *Foreign_Segment* are also significant and positive. These results provide additional support for informational motives (H1), adding to our main results in Table 3. Furthermore, proxies for opportunistic motives (*Ind_Adj_Pay_Ratio* and *Excess_comp*) are positively associated with *Abs_Percent_Adjustment* and *Downward_Percent_Adj*, while negatively associated with *Upward_Percent_Adj*. These results further support opportunistic motives (H2) in providing *Supplementary Ratio*, especially *Downward Supplementary Ratio*. Collectively, these findings using the magnitude of adjustments generally strengthen our prior findings and suggest that our results are robust to an alternative measure of the Supplementary Pay Ratio disclosure.

Comparison of Supplementary Pay Ratio with Other Permitted Discretions

I have so far investigated boards' motives for Pay Ratio disclosure only through the Supplementary Pay Ratio. Nonetheless, boards can also utilize other

²⁰ Columns (1) and (2) in Table 5 correspond to Columns (1) and (2) in Table 3. Also, Column (3) in Table 5 matches with Column (1) in Table 4.

permitted discretions within the Required Pay Ratio disclosure, such as selecting any date within three months before the fiscal year end as the “determination date”. In this section, I compare the motives between disclosing Supplementary Pay Ratio and using other permitted discretions in order to further clarify the motives behind Supplementary Pay Ratio disclosure.

Among the seven types of permitted discretions, I focus on the “*Determination Date*” and “*De Minimis Exemption*” adjustments. First, these two discretions affect only the denominator of Pay Ratio (median employee pay) and do not affect the numerator of Pay Ratio (CEO pay), which enable us to focus our attention on the denominator effect of permitted discretions. Second, these two discretions were strongly supported by firms and a large proportion of firms have utilized these discretions. These discretions were introduced in the final rules along with the Supplementary Pay Ratio to accommodate concerns about the proposed rules. Figure 2 Panel B shows that a large proportion of the sample firms use these discretions, 45.1% using *Determination Date* and 30.6% using *De Minimis Exemption*.

I compare the motives behind these two discretions (*Determination Date* and *De Minimis Exemption*) with the motives for the Supplementary Ratio. To ensure a clear comparison, I limit our attention to the sample of firms that adjust median employee pay in the calculation of the Supplementary Pay Ratio. I analyze whether the proxies for informative and opportunistic motives affect firms differently in explaining the likelihood of using the *Determination Date* and *De Minimis Exemption* adjustments versus the likelihood of disclosing a Supplementary Pay Ratio.

I re-estimate Equation (1) using different dependent variables. Table 6

shows the results for the Probit regression model. The dependent variable in Column (1) is *Employee_Pay_Adj*, which has a value of 1 if the firm adjusts the median employee compensation when calculating the Supplementary Pay Ratio. In Column (2) (Column (3)), I use *Determination Date (De Minimis Exemption)* as the dependent variable, which has a value of 1 if the firm uses the *Determination Date (De Minimis Exemption)* adjustment when calculating the Required Pay Ratio.

(TABLE 6 HERE)

In Column (1) of Table 6, *Employee_Pay_Adj* is positively associated with the proxy for opportunistic motives (*Ind_Adj_Ratio*), but not associated with those for informational motives (*New_CEO* and *Foreign_Segment*). In contrast, in Columns (2) and (3), only the proxy for informational motives (*Foreign_Segment*) is significantly associated with *Determination Date* and *De Minimis Exemption*. Although all three dependent variables commonly reflect adjustments in median employee pay, the result shows that only the likelihood of disclosing a Supplementary Ratio is associated with opportunistic motives. Our results suggest that unlike permitted discretions of the Required Ratio such as *Determination Date* and *De Minimis Exemption*, which appear to be used to increase the informativeness of the Pay Ratio disclosure, the Supplementary Pay Ratio disclosure is compromised by opportunistic motives.

Market Reaction to the Announcement of the SEC’s Final Rules on the Pay Ratio Disclosure

So far, our evidence suggests that firms disclose a Supplementary Pay Ratio for both informational and opportunistic motives while firms utilize other permitted discretions in the calculation of Required Pay Ratio for informational motives. To shed further light on this issue, I investigate the market reaction to the announcement of the SEC's final Pay Ratio disclosure rules. Ideally, I could study whether and how the market reacts to Required Pay Ratio disclosure and whether the market reaction is different in firms that provide both the Required Pay Ratio and the Supplementary Pay Ratio on the day of the proxy statement release. However, proxy statements include a wide range of information about executive pay, changes in boards, shareholder proposals, and other governance matters (Brickley 1986), which complicates our interpretation of the market reaction solely attributable to the Pay Ratio disclosure.

I instead use the market reaction to the announcement of the final rules because the SEC first allowed firms to report a Supplementary Pay Ratio in the final rules²¹. Compared to proposed rules released in September 2013²², firms are granted greater flexibility in calculating the Required Pay Ratio and are given an additional outlet – a Supplementary Pay Ratio. Therefore, I select August 5, 2015, the date on which the SEC released the final rules to the public, as the event date for the market reaction analysis.

Prior literature examines the effect of governance-related regulations on

²¹ This was the first explicit mention of the Supplementary Pay Ratio. There is a brief mention of the possibility of a Supplementary Pay Ratio in the Proposed Rules: "Likewise, I note that registrants may, at their discretion, present additional ratios to supplement the required ratio." (Proposed rule, 60) However, the proposed instructions for Item 402(u) did not include any mention about the Supplementary Pay Ratio.

²² Refer to Appendix A for comparison between proposed and final rules on Pay Ratio disclosure by the SEC.

shareholder wealth by analyzing the stock market's reaction to the proposed regulations. For example, Larcker et al. (2011) argue that abnormal returns are significantly positive when regulations reduce the distance from equilibrium governance, which is expected to increase shareholder wealth (Also see Cai and Walkling 2011). By examining the market reaction to the announcement of the final rules, I can infer whether shareholders significantly revise their expectations on the impact of the regulation on shareholder wealth (Larcker et al. 2011, Binder 1985, Schwert 1981).

I first compute the event day abnormal returns (*Abret*) of firms, using the Fama-French-Carhart four-factor model with a 120-day parameter estimation period ending ten days prior to the event day. Table 7 Panel B shows that the abnormal returns for the entire sample on the day of the event are significantly positive (t -statistics=1.77), suggesting that the market views greater flexibility allowed in the final rules (as opposed to the proposed rules in 2013) as value-increasing, on average. Shareholder wealth could increase through lower compliance costs due to the greater flexibility and through less information asymmetry about the Pay Ratio and compensation practices.

However, the Supplementary Pay Ratio was not the only addition to the proposed rule. The final rules permit other additional discretions in the calculation of the Required Pay Ratio, such as exclusion of non-U.S. employees up to 5% of total employees ("*De Minimis exclusion*") and determination of the total-employee pool within three months before the end of the fiscal year ("*Determination Date*"). Since I am only able to observe firms' actual disclosure choice after the rules were effective in 2018, I rely on the *ex post* usage of the Supplementary Pay Ratio in 2018.

I divide the full sample into two subsamples based on whether the firms disclose a Supplementary Pay Ratio in 2018 and examine the differing market reaction between the two groups to the release of the final rules in 2015 retrospectively.

In order to proceed with this analysis, I make two assumptions. First, I assume that the underlying economic characteristics that drive a firm's Supplementary Pay Ratio disclosure persist over time. In particular, it is likely that firm characteristics that drive the informative motives of the Supplementary Pay Ratio do not significantly change over a 3-year period. Indeed, our analysis of the number of foreign segments and the portion of foreign sales of our sample firms indicates that there is no statistically significant difference between 2014 levels and 2017 levels (untabulated).

Second, the market finds the final rules to be value-enhancing because the market believes that greater flexibility in calculating the Required Pay Ratio and providing a Supplementary Pay Ratio would increase the informativeness of firms' overall Pay Ratio disclosure. Consequently, I assume that the market reaction to the release of the final rules would be conditional on the market's assessment of firm benefits from greater flexibility allowed in the final rules. To validate our assumption, in Table 7 Panel A, I regress the firm's event day abnormal returns relative to the CRSP value-weighted market index on the number of foreign segments of the firm in 2014, market-to-book, size, and momentum. I find evidence consistent with the market's positive reaction on the announcement date of the final rules to increase with the number of foreign segments.

If the positive market reaction to the announcement in 2015 is more pronounced in firms disclosing a Supplementary Pay Ratio in 2018 than in firms that do not, I can infer that firms effectively use the Supplementary Ratio channel mainly

to increase the informativeness of firms' overall Pay Ratio disclosure as per market expectations. However, in 2018, if other firms disclose a Supplementary Pay Ratio for opportunistic motives, I expect that the market reaction will not be significantly different between the two groups.

(TABLE 7 HERE)

In Table 7 Panel B, I compare the abnormal returns between the two subsamples and find no evidence that the mean abnormal returns of firms that disclose a Supplementary Pay Ratio are higher than those of firms that do not disclose a Supplementary Pay Ratio (F-value: 0.1, p-value:0.75). This result suggests that firms that subsequently disclose a Supplementary Pay Ratio in 2018 are not the same firms that shareholders had expected to benefit from greater flexibility when the final rules were released. This implies that the actual disclosure of the Supplementary Pay Ratio is somewhat compromised by opportunistic motives.

For comparison, I conduct similar analysis on the subsamples divided by the use of other newly permitted discretions such as *Determination Date* and *De Minimis Exemption* in 2018. I examine whether the market reaction in 2015 is significantly different between the subsamples that do or do not use these permitted discretions. I find significantly higher abnormal returns for firms that adjust for *Determination Date* in 2018 than for firms that do not. This difference implies the use of *Determination Date* in 2018 was mainly driven by informative motives, as the shareholders expected in 2015. For *De Minimis Exemption*, abnormal returns are not significantly higher for firms that use *De Minimis Exemption* in 2018 than for firms that do not. Albeit indirect, our market reaction test suggests that the actual

Supplementary Pay Ratio disclosure firms in the initial year subsequent to the final rule adoption are at least somewhat different from those the market expected to benefit from increasing the informativeness of their pay ratio disclosure through the Supplementary Pay Ratio disclosure.

The Effect of Employee Perception on the Fairness of Compensation Practices

To examine the effect on Supplementary Pay Ratio disclosure of the perceived fairness of compensation practices, I further add in our main analysis a measure of employee satisfaction on compensation practices of the firm. Following Rouen (2017), I calculate *Just Fair Pay* using public data from JUST Capital. *Just Fair Pay* is the average of scores on four dimensions directly related to employee compensation, all of which have a mean of 50 and a standard deviation of 20. A higher value of *Just Fair Pay* means that the pay is perceived to be more fairly distributed within the firm. I predict that the perceived fairness directly reduces the political costs of disclosing a high pay ratio, and accordingly predict a negative association between the perceived fairness and Supplementary Pay Ratio disclosure. Furthermore, *Just Fair Pay* is expected to moderate the association between the labor unionization rate and Supplementary Pay Ratio disclosure; greater perceived fairness is likely to reduce the political costs incurred by a high labor unionization rate. Therefore, I add the interaction term, $Just\ Fair\ Pay \times Unionization$, in the main regression model. In untabulated results, I find no significant main effect of *Just Fair Pay* on the likelihood of providing a Supplementary Pay Ratio disclosure, but find significant and negative coefficients on the interaction term of *Just Fair Pay* and

Unionization. Results on main variables remain qualitatively similar.

VII. CONCLUSION

The Pay Ratio information from Section 953 (b) provides a unique opportunity to study factors influencing firms' disclosure choice on vertical pay disparity. I analyze whether the pervasive motives for Supplementary Pay Ratio disclosure are to provide stakeholders with more transparent information or to manage stakeholder perceptions. I find evidence that both informational and opportunistic motives drive the Supplementary Pay Ratio disclosure. Firms with a newly hired CEO or more geographical segments are more likely to provide a Supplementary Pay Ratio, consistent with firms disclosing a Supplementary Pay Ratio when the discretions allowed in the Required Pay Ratio calculation are insufficient to fully reflect firm-specific circumstances.

We, however, also find evidence that firms with greater excess CEO compensation and industry-adjusted Required Pay Ratios are more likely to disclose a Supplementary Pay Ratio. Firms with more effective boards are less likely to disclose a Supplementary Pay Ratio lower than the Required Pay Ratio, suggesting that opportunistic motives are more salient in the lower Supplementary Pay Ratio disclosure. Political costs borne by firms also affect the disclosure decision of boards. While underperforming firms tend to provide a Supplementary Pay Ratio to bypass being criticized of 'paying-for-failure', more visible firms are reluctant to provide a Supplementary Pay Ratio possibly in order to avoid being accused of attempting to manage stakeholder perception of pay equity.

When I focus on the sample of firms that provide a Supplementary Pay Ratio higher than the Required Pay Ratio, I find that disclosures of Supplementary Pay Ratios higher than the Required Pay Ratios are also explained by informational motives, opportunistic motives, and political costs. More importantly, these firms are further motivated to signal significant tournament incentives for labor market considerations above and beyond the informational, opportunistic, and political motives.

Our findings provide timely and relevant evidence on Pay Ratio disclosure to regulators, investors, and other stakeholders. Our finding that Pay Ratio disclosure can be compromised by self-serving incentives of managers should aid regulators who seek evidence on whether Section 953 (b) is executed to enhance the informativeness of the Pay Ratio or to manage stakeholder perceptions of CEO pay fairness. Therefore, I suggest more specific and stricter guidelines for the Supplementary Pay Ratio disclosure.

Our findings are subject to the following limitations. Our study focuses only on the Supplementary Pay Ratio disclosure and does not fully investigate board incentives for the Required Pay Ratio disclosure and the other permitted discretions reflected in the Required Pay Ratio. Future research can further explain Pay Ratio disclosure behavior by incorporating the other discretions into the analysis, especially as the disclosure regulation progresses throughout the coming years. Furthermore, I expect firm disclosure behavior to be different in the future as our sample consists of the initial year of disclosed data. Future research could also examine the consequences of the Supplemental Pay Ratio disclosure. By studying whether there is an incremental predictive power of the Supplementary Pay Ratio disclosure in explaining the relation between the Pay Ratio and firm performance

and/or employee satisfaction, future research could help better disentangle the complex incentives for the Supplementary Pay Ratio disclosure.

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APPENDIX A

A brief comparison between the proposed rules and the final rules on *Pay Ratio Disclosure*

Items	Proposed Rule	Final Rule
Announcement Date	2013-09-18	2015-08-05
De Minimis Exemption	Not mentioned	Permitted
Employee determination date	The Last Day of the fiscal year	Any date within Three Months prior to the last day of the fiscal year
Statistical Method	Permitted	Permitted
CACM	Permitted	Permitted
Cost of Living Adjustment	Not mentioned	Permitted
Benefit Addition	Permitted	Permitted
Annualization	Permitted	Permitted
Supplementary Ratio	Not clearly stated	Clearly permitted
Employee of subsidiaries	All subsidiaries	Only Consolidated Subsidiaries
Identifying Median Employee	Every Year	Once Every Three Years
Compliance Date	First fiscal year commencing on or after the effective date of the final rule	First full fiscal year beginning on or after January 1, 2017
Transitional Period	Only for New Registrants	Including registrants that cease to be smaller reporting or emerging growth companies
Others		Registrants that engage in business combinations and/or acquisitions can omit the employees of a newly-acquired entity

APPENDIX B

TIMELINE OF INTRODUCING THE SEC'S NEW PAY RATIO DISCLOSURE RULES

July 21, 2010: *Dodd-Frank Wall Street Reform and Consumer Protection Act* was legislated

September 18, 2013: SEC released the proposed rule *Pay Ratio Disclosure*

September 18, 2013 to December 2, 2013: Open for public comments
SEC received more than 287,000 comment letters, both supporting and criticizing the proposed rule

August 5, 2015: SEC released the final rule *Pay Ratio Disclosure*

February 6, 2017 to March 22, 2017: Reconsideration of Pay Ratio Rule Implementation and Open for public comments

Compliance Date:

The disclosure is required in any annual report, proxy or information statement, or registration statement that requires executive compensation disclosure pursuant to Item 402 of Regulation S-K. The disclosure requirement does not apply to emerging growth companies, smaller reporting companies, or foreign private issuers. Registrants must comply with the final rule for the first fiscal year beginning on or after January 1, 2017. (Directly quoted from SEC)

APPENDIX C

Examples of Pay Ratio Disclosure and Permitted Discretions

1. Firms in *No Discretion* Group (Group 1)

(Devon Energy Corp. 2018 Proxy Statement)

CEO Pay Ratio

Section 953(B) of the Dodd-Frank Wall Street Reform and Consumer Protection Act requires certain public companies to disclose the median pay of Company employees, the method of determining median pay, and the ratio of CEO pay to median employee pay. Devon's employees, which are all located in the U.S. and Canada, are included in the calculation of median pay based on Devon's employee population as of **December 31, 2017**. ...

For CEO pay, Devon used the amount for 2017 reflected in the Summary Compensation Table (SCT), which includes LTI granted in the year. In determining the median pay of employees, Devon ***replicated the components of the SCT with respect to 2017 for all employees***. Based on this methodology, CEO pay is \$13.4 million, median employee pay is \$134.8 thousand and the ratio is 100:1.

2. Firms in Discretion within the Required Pay Ratio Group (Group 2)

(Walmart Inc. 2018 Proxy Statement)

CEO Pay Ratio

Considered Population. As of December 31, 2017, we employed approximately 2,306,496 associates worldwide, other than our CEO. As permitted by SEC rules, in order to determine our median associate, we ***excluded approximately 3.9% of our total associate population or approximately 89,951 associates outside of the U.S. from the following countries: Argentina (12,737); Bangladesh (95); ... and Zambia (461)***. Therefore, an aggregate associate population of approximately 2,216,545 was considered (the “considered population”) in determining our median associate. **(‘De Minimis Exclusion’)**

Identifying our Median Associate. In determining our median associate, we used calendar year 2017 gross earnings – meaning total amounts paid before deductions or adjustments, including wages, overtime, bonuses, and the value of any equity awards that vested and were paid to an associate during calendar year 2017.

Adjustments were made to annualize the gross earnings of all newly hired permanent associates in the considered population who did not work for the entire calendar year 2017. From the considered population, we then used ***statistical sampling to identify a group of associates who were paid within a range of 0.5% above or below what we estimated to be our median gross earnings amount*** (the “median population”). ... this group. **(‘Annualization’, ‘Statistical Sampling’)**

> uses three discretions: ‘De Minimis Exclusion’, ‘Annualization’, ‘Statistical Sampling’

3. Firms in Supplementary Pay Ratio Group (Group 3)

i. (Mattel Inc. 2018 Proxy Statement) – Lower than the required Pay Ratio

PAY RATIO OF CEO TO MEDIAN EMPLOYEE

Total Annual Compensation in 2017 for our CEO was \$31,275,289, as reported in the SCT, which when compared to the Total Annual Compensation for our global median employee of \$6,271, results in a pay ratio of 4,987:1.

Supplemental Pay Ratio

We are presenting an alternative pay ratio that we believe facilitates a better understanding of our CEO annual equity grant practices....

The supplemental pay *ratio excludes the one-time make-whole and one-time new hire inducement grants to our CEO, and thus includes only the \$8.25 million of her 2017 annual long-term incentive equity grant value*. For purposes of this ratio, Ms. Georgiadis' Total Annual Compensation is \$9,577,997, which when compared to the Total Annual Compensation of our global median employee of \$6,271, results in a pay ratio of 1,527:1.

	CEO Total Annual Compensation	Median Employee Total Annual Compensation	Pay Ratio
SEC Required Calculation	\$ 31,275,289	\$6,271	4,987:1
Supplemental Pay Ratio	\$ 9,577,997 ⁽¹⁾	\$6,271	1,527:1

⁽¹⁾ CEO Total Annual Compensation for the Supplemental Pay Ratio is SCT reported pay, excluding one-time make-whole and new hire inducement equity grants.

ii. (Equinix Inc. 2018 Proxy Statement) – Higher than the required Pay Ratio

CEO to median employee pay ratio

Our CEO to Median Employee pay ratio is approximately 107:1 and was calculated in accordance with Item 402(u) of Regulation S-K. We believe this ratio to be a reasonable estimate, based upon the assumptions and adjustments described below.

...

However, as supplemental information, we note that had our chief executive officer not resigned in Jan. 2018 before payment of his cash bonus award under our 2017 annual incentive plan, *his annual total compensation for fiscal 2017 would have been \$14,111,869 and the resulting ratio of the chief executive officer annual total compensation to that of our Median Employee for fiscal year 2017 would have been approximately 119:1.*

APPENDIX D

Variable Definition

Variable	Definition
<i>Pay_Ratio</i>	Disclosed Required Pay Ratio
<i>Supplementary_Ratio_Disclosure</i>	1 if the firms disclose an additional Pay Ratio or use the cost of living adjustment, and 0 otherwise
<i>Higher_Supplementary_Ratio_Disclosure</i>	1 if the disclosed Supplementary Pay Ratio is higher than the Required Pay Ratio, and 0 otherwise
<i>Percent_Adjustment</i>	$(\text{Supplementary Pay Ratio} - \text{Required Pay Ratio}) / \text{Required Pay Ratio}$ if Supplementary Pay Ratio is disclosed, and 0 otherwise
<i>Abs_Percent_Adjustment</i>	The absolute value of <i>Percent_Adjustment</i>
<i>Upward_Percent_Adjustment</i>	$(\text{Supplementary Pay Ratio} - \text{Required Pay Ratio}) / \text{Required Pay Ratio}$ if Supplementary Pay Ratio higher than the Required Pay Ratio is disclosed, and 0 otherwise
<u>Independent Variable</u>	
<i>Foreign_Segment</i>	Log (the number of geographical segment), from Compustat and 10-K
<i>New_CEO</i>	1 if the CEO transition occurs during the fiscal year of 2017, from Proxy Statements, and 0 otherwise
<i>Ind_Adj_Pay_Ratio</i>	$(\text{Pay_ratio} - \text{Industry Median Pay_ratio}) / \text{Industry Median Pay_Ratio}$ based on Fama-French 48 Industry Classification, from Proxy Statements
<i>Excess_Comp</i>	Residual term from the regression model of expected compensation following Core et al. (2008)
<i>Unionization</i>	Industry-level Labor Unionization Rate, from UMCD
<i>Consumer_Goods_Industry</i>	1 if the firm's SIC classification is in the consumer goods industry, and 0 otherwise, following Sharpe (1982)
<i>Stock_Return</i>	Annual stock return in the fiscal year 2017
<i>Size</i>	log (total asset), from Compustat
<i>Leverage</i>	Total debt / Total asset, from Compustat
<i>Close_to_Retire</i>	1 if the CEO's age is equal to or above 62, and 0 otherwise, from Proxy Statements
<i>Market_to_Book</i>	Market value of total assets / Book value of total assets
<i>Board_Size</i>	Logarithm of the number of board members, from Proxy Statements
<i>Board_Meeting</i>	Logarithm of the frequency of board meetings, from Proxy Statements
<i>Board_Independence</i>	The proportion of independent directors in the board, from Proxy Statements
<i>Competition</i>	1-Herfindahl Index, from Compustat
<i>Disclosure_Quality</i>	Frequency of management earnings forecasts during the fiscal year of 2017
<i>Institutional_Onwership</i>	The percentage of total shares outstanding held by top 5 institutional investors

FIGURE 1**Panel A: The Sample Selection Process and the Sample Composition of Discretions**

Sample Selection Process	Number of firms
All Firms disclosing the Pay Ratio until 31 July, 2018	1168
(Less) Firms with no excess CEO compensation data	(4)
(Less) Firms unmatched with labor unionization data	(27)
(Less) Firms with insufficient financial data	(12)
Final Sample Size	1125

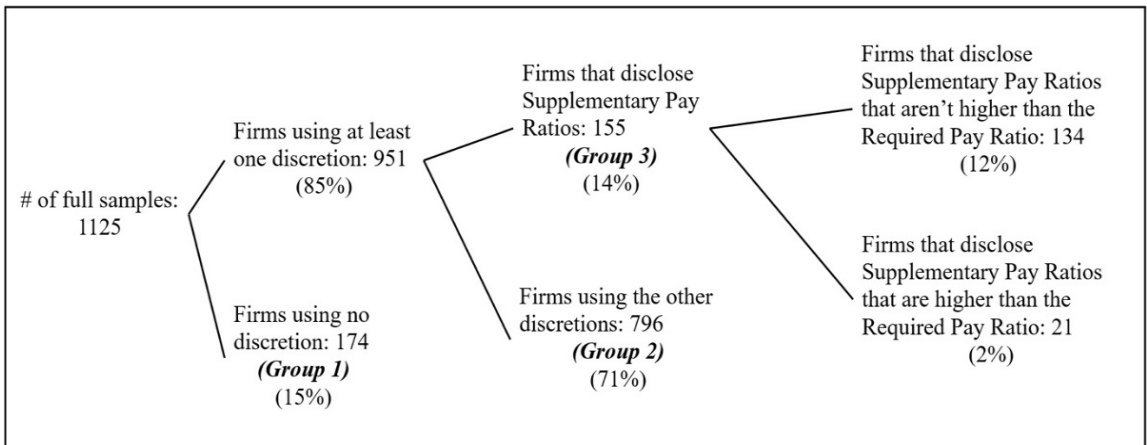
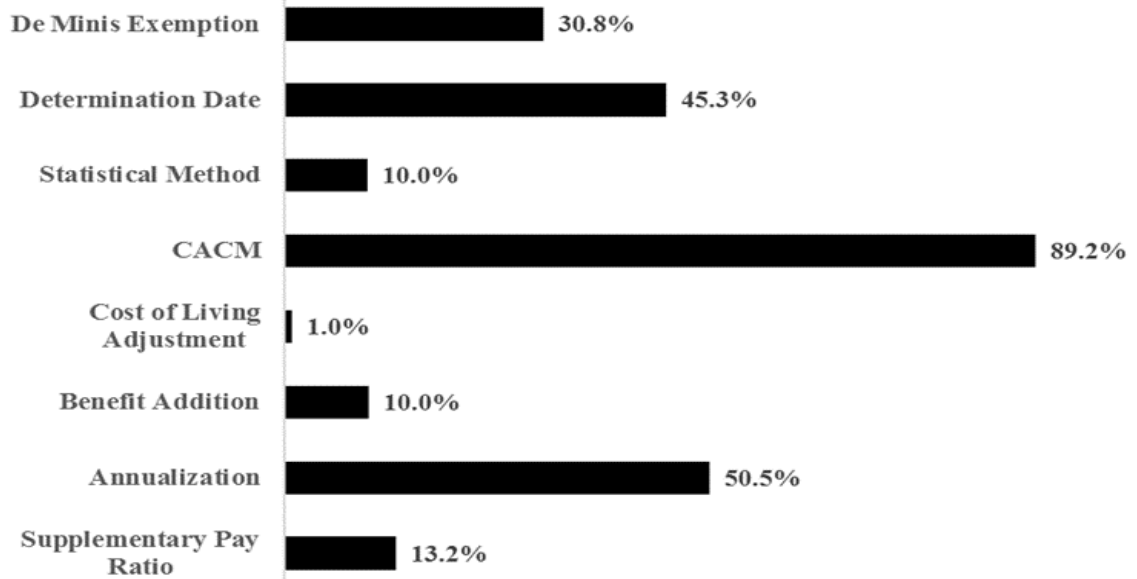
**Panel B: The Percentage of Sample Firms Using each Discretion**

TABLE 1

Descriptive Statistics of the Sample

Variable	N	Mean	Median	Standard Deviation	Minimum	Q1	Q3	Maximum
<i>Pay Ratio</i>	1,125	191.51	94.00	337.83	0.00	52.00	194.00	4987.00
<i>Supplementary_Ratio_ Disclosure</i>	1,125	0.14	0.00	0.34	0.00	0.00	0.00	1.00
<i>Pay_Ratio (Supplementary_Ratio_ _Disclosing_Firm)</i>	155	354.82	156.00	570.98	0.75	91.00	449.00	4987.00
<i>Supplementary_Ratio</i>	155	156.22	98.00	175.84	3.30	55.00	193.00	1527.00
<i>Percent_Adjustment</i>	155	-0.26	-0.39	0.65	-0.94	-0.63	-0.16	3.33
<i>Higher_Supplementary _Ratio_Disclosure</i>	1,125	0.02	0.00	0.14	0.00	0.00	0.00	1.00
<i>Pay_Ratio (Higher_Supplementary _Ratio_Firm)</i>	21	98.08	72.00	98.20	0.75	33.00	111.00	408.00
<i>Higher_Supplementary _Ratio_Disclosure</i>	21	178.99	130.00	155.71	21.00	64.00	196.00	657.00
<i>Upward_Percent _Adjustment</i>	21	0.99	0.64	0.97	0.08	0.37	1.31	3.33
<u>Independent Variable</u>								
<i>New_CEO</i>	1,125	0.11	0.00	0.31	0.00	0.00	0.00	1.00
<i>Foreign_Segment</i>	1,125	0.71	0.69	0.75	0.00	0.00	1.39	2.64
<i>Ind_Adj_Pay_Ratio</i>	1,125	0.47	0.00	1.46	-0.93	-0.41	0.73	6.98
<i>Excess_Comp</i>	1,125	0.04	0.08	0.58	-2.23	-0.24	0.37	1.52
<i>Unionization</i>	1,125	0.07	0.03	0.08	0.00	0.02	0.09	0.37
<i>Consumer_Goods _Industry</i>	1,125	0.28	0.00	0.45	0.00	0.00	1.00	1.00
<i>Stock_Return</i>	1,125	0.19	0.16	0.39	-0.62	-0.05	0.37	1.61
<i>Size</i>	1,125	8.55	8.50	1.65	5.22	7.33	9.70	12.85
<i>Leverage</i>	1,125	0.28	0.27	0.20	0.00	0.11	0.40	0.90
<i>Close_to_Retire</i>	1,125	0.25	0.00	0.43	0.00	0.00	1.00	1.00
<i>Market_to_Book</i>	1,125	2.07	1.55	1.50	0.80	1.15	2.35	9.53
<i>Board_Size</i>	1,125	2.26	2.30	0.24	1.61	2.08	2.40	2.77
<i>Board_Meeting</i>	1,125	1.98	1.95	0.40	1.39	1.61	2.30	3.09
<i>Board_Independence</i>	1,125	0.83	0.88	0.09	0.50	0.80	0.90	0.93
<i>Competition</i>	1,125	0.95	0.95	0.04	0.76	0.93	0.98	0.99
<i>Disclosure_Quality</i>	1,125	3.72	4.00	2.62	0.00	1.00	5.00	11.00
<i>Institutional_Ownership</i>	1,125	0.34	0.35	0.10	0.00	0.29	0.40	0.58

The sample consists of 1,125 unique S&P 1500 firms in 2017. Data for discretions in the Pay Ratio disclosure and the board characteristics are manually collected from Proxy Statements. Financial Performance data and Segment data are obtained from CRSP and Compustat. Unionization rate is obtained from UMCD. Management earnings forecast is obtained from I/B/E/S. I use the Fama-French 48 Industry Classification. All continuous variables are winsorized at the top and bottom one percentile.

See Appendix D for variable definitions.

TABLE 2
Pearson Correlation Matrix

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)
(1) Supplementary _Ratio_Disclosure																		
(2) Higher _Supplementary _Ratio_Disclosure	0.35*																	
(3) New_CEO	0.11*	0.08*																
(4) Foreign_Segment	0.08*	0.08*	0.003															
(5) Ind_Adj_Pay_Ratio	0.25*	- 0.06*	0.06*	0.16*														
(6) Excess_Comp	0.15*	- 0.10*	-0.03	0.06*	0.35*													
(7) Unionization	-0.03	-0.04	-0.02	-0.02	-0.06	-0.02												
(8) Consumer_Goods _Industry	0.00	-0.03	-0.05	0.05	0.03	0.00	0.00											
(9) Stock_Return	-0.02	0.04	-0.03	0.08*	0.12*	-0.06	0.04	-0.05										
(10) Size	-0.03	0.01	0.02	-0.05	0.33*	0.08*	0.63*	0.15*	0.23*									
(11) Leverage	-0.02	-0.02	0.02	0.01	0.07*	0.09*	0.03	0.05	0.06	0.15*								
(12) Close to Retire	0.01	0.04	-0.04	-0.05	0.04	-0.02	-0.01	-0.01	-0.13*	-0.06*	0.03							
(13) Market_to_Book	0.04	0.05	-0.04	0.16*	0.03	-0.00	-0.15*	-0.16*	-0.12*	-0.13*	0.13*	0.35*						
(14) Board_Size	-0.01	0.04	0.06*	-0.01	0.23*	0.10*	0.12*	0.23*	0.07*	0.00	0.04	0.63*	0.03					
(15) Board_Meeting	-0.02	0.05	0.21*	-0.02	0.02	0.06	0.12*	0.19*	-0.02	-0.07*	-0.05	0.15*	0.05	-0.01				
(16) Board _Independence	-0.04	0.05	0.01	0.10*	0.08*	0.12*	0.23*	0.19*	0.07*	-0.09*	-0.04	0.23*	0.06	-0.13*	-0.12*			
(17) Competition	0.002	-0.04	-0.03	- 0.36*	0.03	-0.01	0.09*	0.11*	0.07*	-0.10*	-0.33*	0.00	0.22*	-0.02	0.01	0.16*		
(18) Disclosure_Quality	0.06*	0.06	0.02	0.23*	0.08*	0.10*	0.02	-0.05	0.13*	0.15*	0.11*	0.00	0.01	0.22*	-0.10*	-0.17*	-0.21*	
(19) Institutional _Ownership	-0.03	-0.05	0.03	- 0.12*	-0.16*	0.03	-0.23*	0.04	-0.05	-0.05	-0.01	-0.16*	-0.33*	0.11*	0.00	0.06*	0.03	-0.03

* indicate significance at the 5 percent level.

This table presents Pearson correlations in the lower diagonal. All continuous variables are winsorized at the top and bottom one percentile.

TABLE 3
Probit Estimation Results of Testing H1, H2, and H3
- Incentives to Provide Supplementary Pay Ratio

Independent Variable	Predicted Sign	Sample : All firms		Sample : Firms using at least one discretion	
		(1) Coefficients (z-value)	(2) Coefficients (z-value)	(3) Coefficients (z-value)	(4) Coefficients (z-value)
<i>Intercept</i>		-0.955 (-0.64)	-0.654 (-0.39)	-0.682 (-0.43)	-0.407 (-0.23)
<i>New_CEO</i>	+	0.496*** (3.43)	0.454*** (2.87)	0.543*** (3.53)	0.492*** (2.93)
<i>Foreign_Segment</i>	+	0.098* (1.41)	0.056 (0.75)	0.058 (0.80)	0.016 (0.21)
<i>Ind_Adj_Pay_Ratio</i>	+	0.193*** (5.71)	0.231*** (6.48)	0.197*** (5.48)	0.236*** (6.20)
<i>Excess_Comp</i>	+	0.248** (2.27)	0.462*** (3.63)	0.226** (2.05)	0.443*** (3.47)
<i>Unionization</i>	+	0.191 (0.28)	0.948* (1.34)	0.122 (0.17)	0.918 (1.26)
<i>Consumer_Goods_Industry</i>	+	-0.110 (-0.92)	-0.052 (-0.40)	-0.173 (-1.37)	-0.112 (-0.83)
<i>Stock_Return</i>	-	-0.225** (-1.67)	-0.347** (-2.23)	-0.233** (-1.68)	-0.355** (-2.23)
<i>Size</i>	?	-0.099** (-2.22)	-0.110** (-2.24)	-0.106** (-2.32)	-0.120** (-2.36)
<i>Leverage</i>	+	-0.235 (-0.85)	-0.251 (-0.83)	-0.246 (-0.83)	-0.257 (-0.80)
<i>Board_Size</i>	?	0.087 (0.33)	-0.084 (-0.28)	0.076 (0.27)	-0.090 (-0.30)
<i>Board_Meeting</i>	-	-0.094 (-0.70)	-0.217 (-1.49)	-0.123 (-0.87)	-0.243 (-1.61)
<i>Board_Independence</i>	-	-0.949* (-1.69)	-1.313** (-2.16)	-1.163** (-2.01)	-1.538** (-2.44)
<i>Competition</i>	+	1.386 (0.94)	1.887 (1.14)	1.587 (0.99)	2.135 (1.18)
<i>Disclosure_Quality</i>	+	0.041** (1.97)	0.033 (1.48)	0.043** (2.01)	0.035 (1.49)
<i>Institutional_Ownership</i>		-0.485 (-0.93)	-0.241 (-0.42)	-0.466 (-0.83)	-0.274 (-0.44)
Observations		1,125	1,125	951	951
Pseudo R ²		10.1%	15.6%	10.2%	15.8%

All variables are winsorized at the top and bottom one percentile. *, **, and *** correspond to 10 percent, 5 percent, and 1 percent significance levels, respectively (one-tailed test if a signed prediction is provided, two-tailed otherwise). This table shows the coefficient estimates of the determinants of Supplementary Pay Ratio disclosure for the following Equation (1):

$$\begin{aligned}
 & \text{Prob (Supplementary Ratio Disclosure}=1)_i \text{ or Prob (Lower Supplementary Ratio Disclosure)=1}_i \\
 & = \beta_0 + \beta_1 \text{New_CEO}_i + \beta_2 \text{Foreign_Segment}_i + \beta_3 \text{Ind_Adj_Pay_Ratio}_i + \beta_4 \text{Excess_Comp}_i + \beta_5 \text{Unionization}_i + \\
 & \beta_6 \text{Consumer_Goods_Industry}_i + \beta_7 \text{Stock_Return}_i + \beta_8 \text{Size}_i + \beta_9 \text{Leverage}_i + \beta_{10} \text{Board_Size}_i + \beta_{11} \\
 & \text{Board_Meeting}_i + \beta_{12} \text{Board_Independence}_i + \beta_{13} \text{Competition}_i + \beta_{14} \text{Disclosure_Quality}_i + \beta_{15}
 \end{aligned}$$

Institutional_Ownership_i + u_i

See Appendix D for variable definitions. Columns (1) and (2) are based on the entire sample of firms. Columns (3) and (4) are based on subsample of firms that use at least one discretion in the Pay Ratio disclosure. Columns (1) and (3) use *Prob (Supplementary Ratio Disclosure=1)* as the dependent variable while Columns (2) and (4) use *Prob (Lower Supplementary Ratio Disclosure=1)*.

TABLE 4

Penalized Maximum Likelihood Estimation Results of Testing H1, H2, H3, and H4

- Incentives to Provide Higher Supplementary Pay Ratio

Independent Variable	Predicted Sign	Sample : All firms	Sample : Firms using at least one discretion
		(1) Coefficient (z-value)	(2) Coefficient (z-value)
<i>Intercept</i>		-13.742 (2.28)	-13.492 (2.18)
<i>New_CEO</i>	?	1.033** (2.03)	1.059** (2.04)
<i>Foreign_Segment</i>	?	0.459* (1.59)	0.39* (1.31)
<i>Ind_Adj_Pay_Ratio</i>	-	-0.801** (2.14)	-0.776** (2.11)
<i>Excess_Comp</i>	-	-0.914*** (2.75)	-0.946*** (2.81)
<i>Unionization</i>	-	-4.239 (1.18)	-4.667 (1.28)
<i>Consumer_Goods_Industry</i>	-	-0.581 (1.10)	-0.707* (1.32)
<i>Stock_Return</i>	+	0.224 (0.38)	0.140 (0.23)
<i>Size</i>	?	-0.001 (0.00)	-0.011 (0.06)
<i>Leverage</i>	-	-0.625 (0.53)	-0.628 (0.51)
<i>Close_to_Retire</i>	+	0.947** (2.14)	0.942** (2.11)
<i>Market_to_Book</i>	+	0.230** (1.69)	0.229** (1.67)
<i>Board_Size</i>	?	2.208* (1.78)	2.211* (1.75)
<i>Board_Meeting</i>	+	0.628 (1.20)	0.505 (0.93)
<i>Board_Independence</i>	+	6.454** (2.04)	6.035* (1.88)
<i>Competition</i>	+	-2.701 (0.53)	-2.120 (0.40)
<i>Disclosure_Quality</i>	+	0.158* (1.92)	0.162* (1.92)
<i>Institutional_Ownership</i>	+	-2.544 (1.19)	-1.988 (0.89)
Observations		1,125	951
Pseudo R ²		25.7%	25.8%

All variables are winsorized at the top and bottom one percentile. *, **, and *** correspond to 10 percent, 5 percent, and 1 percent significance levels, respectively (one-tailed test if a signed prediction is provided, two-tailed otherwise). This table shows the coefficient estimates of the determinants of disclosing a Supplementary Pay Ratio higher than the Required Pay Ratio for the following Equation (2):

$$\begin{aligned} \text{Prob (Higher Supplementary Ratio Disclosure=1)}_i = & \beta_0 + \beta_1 \text{New_CEO}_i + \beta_2 \text{Foreign_Segment}_i + \beta_3 \\ & \text{Ind_Adj_Pay_Ratio}_i + \beta_4 \text{Excess_Comp}_i + \beta_5 \text{Unionization}_i + \beta_6 \text{Consumer_Goods_Industry}_i + \beta_7 \text{Stock_Return}_i \\ & + \beta_8 \text{Size}_i + \beta_9 \text{Leverage}_i + \beta_{10} \text{Close_to_Retire}_i + \beta_{11} \text{Book_to_Market}_i + \beta_{12} \text{Board_Size}_i + \beta_{13} \text{Board_Meeting}_i + \\ & \beta_{14} \text{Board_Independence}_i + \beta_{15} \text{Competition}_i + \beta_{16} \text{Disclosure_Quality}_i + \beta_{17} \text{Institutional_Ownership}_i + u_i \end{aligned}$$

See Appendix D for variable definitions. Column (1) is based on the entire sample and Column (2) is based on the subsample of firms that use at least one discretion in the Pay Ratio.

TABLE 5

Tobit Estimation Results of Testing H1, H2, H3, and H4

Independent Variable	<i>Abs_Percent_ Adjustment</i>	<i>Downward_Percent Adj</i>	<i>Upward_Percent Adj</i>
	(1) Coefficient (z-value)	(2) Coefficient (z-value)	(3) Coefficient (z-value)
<i>Intercept</i>	-0.795 (-0.59)	-0.217 (-0.19)	-14.944** (-2.44)
<i>New_CEO</i>	0.394*** (3.21)	0.256*** (2.59)	0.692** (1.67)
<i>Foreign_Segment</i>	0.119** (1.82)	0.036 (0.72)	0.458** (2.07)
<i>Ind_Adj_Pay_Ratio</i>	0.176*** (6.15)	0.170*** (7.61)	-0.939*** (-2.57)
<i>Excess_Comp</i>	0.103 (1.00)	0.275*** (3.37)	-0.955*** (-3.05)
<i>Unionization</i>	-0.118 (-0.19)	0.527 (1.14)	-3.922 (-1.07)
<i>Consumer_Goods_Industry</i>	-0.092 (-0.86)	-0.009 (-0.11)	-0.512 (-1.03)
<i>Stock_Return</i>	-0.203** (-1.74)	-0.257*** (-2.45)	0.381 (0.91)
<i>Size</i>	-0.083** (-2.22)	-0.085*** (-2.64)	0.086 (0.55)
<i>Leverage</i>	-0.318 (-1.24)	-0.151 (-0.74)	-0.487 (-0.51)
<i>Close_to_Retire</i>			0.697** (1.87)
<i>Market_to_Book</i>			0.185** (1.70)
<i>Board_Size</i>	0.024 (0.10)	-0.104 (-0.54)	1.931** (2.00)
<i>Board_Meeting</i>	-0.023 (-0.18)	-0.111 (-1.19)	0.629 (1.41)
<i>Board_Independence</i>	-0.802* (-1.69)	-0.916** (-2.41)	5.555* (1.89)
<i>Competition</i>	1.047 (0.74)	1.197 (1.07)	-1.001 (-0.26)
<i>Disclosure_Quality</i>	0.048** (2.12)	0.026* (1.69)	0.163* (1.84)
<i>Institutional_Ownership</i>	-0.549 (-1.06)	-0.191 (-0.51)	-2.153 (-1.38)
Observations	1,125	1,125	1,125
Pseudo R ²	8.5%	16.5%	23.0%

All variables are winsorized at the top and bottom one percentile. *, **, and *** correspond to 10 percent, 5 percent, and 1 percent significance levels, respectively (one-tailed test if a signed prediction is provided, two-tailed otherwise). This table re-examines all the hypotheses with a continuous variable that measures the disclosure of Supplementary Pay Ratio with the magnitude of adjustment to the Required Pay Ratio. Column (1) shows the result from following Tobit regression model with robust standard error, which has the same independent variables as Eq. (1).

$$\begin{aligned} \text{Abs_Percent_Adjustment}_i = & \beta_0 + \beta_1 \text{New_CEO}_i + \beta_2 \text{Foreign_Segment}_i + \beta_3 \text{Ind_Adj_Pay_Ratio}_i + \beta_4 \\ & \text{Excess_Comp}_i + \beta_5 \text{Unionization}_i + \beta_6 \text{Consumer_Goods_Industry}_i + \beta_7 \text{Stock_Return}_i + \beta_8 \text{Size}_i + \beta_9 \text{Leverage}_i \\ & + \beta_{10} \text{Board_Size}_i + \beta_{11} \text{Board_Meeting}_i + \beta_{12} \text{Board_Independence}_i + \beta_{13} \text{Competition}_i + \beta_{14} \\ & \text{Disclosure_Quality}_i + \beta_{15} \text{Institutional_Ownership}_i + u_i \end{aligned}$$

Column (2) shows the result from following Tobit regression model with robust standard error, which has the same independent variables as Eq. (1).

$$\begin{aligned} \text{Downward_Percent_Adjustment}_i = & \beta_0 + \beta_1 \text{New_CEO}_i + \beta_2 \text{Foreign_Segment}_i + \beta_3 \text{Ind_Adj_Pay_Ratio}_i + \beta_4 \\ & \text{Excess_Comp}_i + \beta_5 \text{Unionization}_i + \beta_6 \text{Consumer_Goods_Industry}_i + \beta_7 \text{Stock_Return}_i + \beta_8 \text{Size}_i + \beta_9 \text{Leverage}_i \\ & + \beta_{10} \text{Board_Size}_i + \beta_{11} \text{Board_Meeting}_i + \beta_{12} \text{Board_Independence}_i + \beta_{13} \text{Competition}_i + \beta_{14} \\ & \text{Disclosure_Quality}_i + \beta_{15} \text{Institutional_Ownership}_i + u_i \end{aligned}$$

Column (3) shows the result from following Tobit regression model with robust standard error, which has the same independent variables as Eq. (2).

$$\begin{aligned} \text{Upward_Percent_Adjustment}_i = & \beta_0 + \beta_1 \text{New_CEO}_i + \beta_2 \text{Foreign_Segment}_i + \beta_3 \text{Ind_Adj_Pay_Ratio}_i + \beta_4 \\ & \text{Excess_Comp}_i + \beta_5 \text{Unionization}_i + \beta_6 \text{Consumer_Goods_Industry}_i + \beta_7 \text{Stock_Return}_i + \beta_8 \text{Size}_i + \beta_9 \text{Leverage}_i \\ & + \beta_{10} \text{Close_to_Retire}_i + \beta_{11} \text{Book_to_Market}_i + \beta_{12} \text{Board_Size}_i + \beta_{13} \text{Board_Meeting}_i + \beta_{14} \\ & \text{Board_Independence}_i + \beta_{15} \text{Competition}_i + \beta_{16} \text{Disclosure_Quality}_i + \beta_{17} \text{Institutional_Ownership}_i + u_i \end{aligned}$$

See Appendix D for variable definitions.

TABLE 6

**Comparing Employee Pay Adjustment
- Supplementary Pay Ratio, Determination, and De Minimis Exemption**

Independent Variable	<i>Employee_Pay_Adj</i>	<i>Determination</i>	<i>De_Minis_Exemption</i>
	(1) Coefficient (z-value)	(2) Coefficient (z-value)	(3) Coefficient (z-value)
<i>Intercept</i>	-2.445 (-1.20)	0.639 (0.55)	-0.024 (-0.02)
<i>New_CEO</i>	-0.031 (-0.14)	-0.042 (-0.34)	0.073 (0.55)
<i>Foreign_Segment</i>	0.044 (0.51)	0.205*** (3.61)	0.279*** (4.72)
<i>Ind_Adj_Pay_Ratio</i>	0.250*** (6.74)	0.028 (0.88)	0.035 (1.08)
<i>Excess_Comp</i>	-0.006 (-0.05)	0.045 (0.62)	0.037 (0.47)
<i>Unionization</i>	2.111*** (2.69)	0.050 (0.10)	1.066** (2.03)
<i>Consumer_Goods_Industry</i>	0.257** (1.83)	0.140* (1.50)	0.265*** (2.70)
<i>Stock_Return</i>	-0.292* (-1.59)	0.166** (1.66)	0.178** (1.66)
<i>Size</i>	-0.100** (-1.84)	0.012 (0.34)	0.100*** (2.79)
<i>Leverage</i>	-0.137 (-0.37)	-0.008 (-0.04)	-0.182 (-0.83)
<i>Board_Size</i>	0.066 (0.19)	0.249 (1.16)	0.008 (0.03)
<i>Board_Meeting</i>	-0.278 (-1.58)	-0.060 (-0.59)	0.035 (0.33)
<i>Board_Independence</i>	-0.242 (-0.34)	0.914** (2.06)	0.913* (1.81)
<i>Competition</i>	1.982 (0.98)	-2.329** (-2.09)	-2.618*** (-2.34)
<i>Disclosure_Quality</i>	0.025 (0.92)	0.020 (1.28)	0.017 (1.04)
<i>Institutional_Ownership</i>	-0.133 (-0.23)	-0.466 (-1.09)	-0.452 (-1.02)
Observations	1,125	1,125	1,125
Pseudo R ²	13.0%	4.3%	7.6%

All variables are winsorized at the top and bottom one percentile. *, **, and *** correspond to 10 percent, 5 percent, and 1 percent significance levels, respectively (one-tailed test if a signed prediction is provided, two-tailed otherwise). This table compares the motives between disclosing a Supplementary Pay Ratio and using other permitted discretions. Column (1) shows the result from following Probit regression model with robust standard error, which has the same independent variables as Eq. (1).

$$\text{Employee_Pay_Adj}_i = \beta_0 + \beta_1 \text{New_CEO}_i + \beta_2 \text{Foreign_Segment}_i + \beta_3 \text{Ind_Adj_Pay_Ratio}_i + \beta_4 \text{Excess_Comp}_i + \beta_5 \text{Unionization}_i + \beta_6 \text{Consumer_Goods_Industry}_i + \beta_7 \text{Stock_Return}_i + \beta_8 \text{Size}_i + \beta_9 \text{Leverage}_i + \beta_{10} \text{Board_Size}_i + \beta_{11} \text{Board_Meeting}_i + \beta_{12} \text{Board_Independence}_i + \beta_{13} \text{Competition}_i + \beta_{14} \text{Disclosure_Quality}_i + \beta_{15} \text{Institutional_Ownership}_i + u_i$$

Column (2) shows the result from following Probit regression model with robust standard error, which has the same independent variables as Eq. (1).

$$\text{Determination}_i = \beta_0 + \beta_1 \text{New_CEO}_i + \beta_2 \text{Foreign_Segment}_i + \beta_3 \text{Ind_Adj_Pay_Ratio}_i + \beta_4 \text{Excess_Comp}_i + \beta_5 \text{Unionization}_i + \beta_6 \text{Consumer_Goods_Industry}_i + \beta_7 \text{Stock_Return}_i + \beta_8 \text{Size}_i + \beta_9 \text{Leverage}_i + \beta_{10} \text{Board_Size}_i + \beta_{11} \text{Board_Meeting}_i + \beta_{12} \text{Board_Independence}_i + \beta_{13} \text{Competition}_i + \beta_{14} \text{Disclosure_Quality}_i + \beta_{15} \text{Institutional_Ownership}_i + u_i$$

Column (3) shows the result from following Probit regression model with robust standard error, which has the same independent variables as Eq. (1).

$$\text{De_Minis_Exemption}_i = \beta_0 + \beta_1 \text{New_CEO}_i + \beta_2 \text{Foreign_Segment}_i + \beta_3 \text{Ind_Adj_Pay_Ratio}_i + \beta_4 \text{Excess_Comp}_i + \beta_5 \text{Unionization}_i + \beta_6 \text{Consumer_Goods_Industry}_i + \beta_7 \text{Stock_Return}_i + \beta_8 \text{Size}_i + \beta_9 \text{Leverage}_i + \beta_{10} \text{Board_Size}_i + \beta_{11} \text{Board_Meeting}_i + \beta_{12} \text{Board_Independence}_i + \beta_{13} \text{Competition}_i + \beta_{14} \text{Disclosure_Quality}_i + \beta_{15} \text{Institutional_Ownership}_i + u_i$$

TABLE 7
Market Reaction to the Release of the SEC's Final Rules on Pay Ratio Disclosure

Panel A: Multivariate Regression of the Abnormal Returns	
Independent Variable	Coefficient (t-value)
<i>Intercept</i>	0.343 (0.76)
<i>Foreign_Segment_2014</i>	0.290*** (2.94)
<i>Market-to-Book</i>	-0.783*** (-4.50)
<i>Size</i>	-0.013 (-0.26)
<i>Momentum</i>	2.09*** (6.93)
Observations	1,113
Adjusted R ²	8.83%

Panel B: Univariate Test of Market Reaction					
Overall Market Reaction	# of Firms	Average Abnormal Returns	t-statistic		
Full Sample	1,114	0.145%	1.77		
Comparison of Market Reaction by Each Subsample				F-value	Pr>F
<i>Supplementary Pay Ratio Disclosure=1</i>	154	0.377%	1.86	0.1	0.754
<i>Supplementary Pay Ratio Disclosure=0</i>	960	0.108%	1.21		
<i>Determination=1</i>	504	0.297%	2.21	4.53**	0.034
<i>Determination=0</i>	610	0.019%	0.19		
<i>De Minimis Exemption=1</i>	342	0.058%	0.4	0.06	0.807
<i>De Minimis Exemption=0</i>	772	0.183%	1.84		

All variables are winsorized at the top and bottom one percentile. *, **, and *** correspond to 10 percent, 5 percent, and 1 percent significance levels, respectively. This table examines the market reaction to the Final Rule release. Panel A shows the result of multivariate analysis from the following OLS regression model based on Larcker et al. (2011)

$$Abret_i = \beta_0 + \beta_1 \text{Foreign_Segment_2014}_i + \beta_2 \text{Market_to_Book}_i + \beta_3 \text{Size}_i + \beta_4 \text{Momentum}_i$$

Panel B shows the result of univariate analysis. I divide the sample into two groups based on the usage of discretions that were newly permitted in the Final Rule and compare the average abnormal return across the groups.

국문초록

최고경영자와 중위 직원간 보충적 임금 비율 공시 동기

도드-프랭크법 (Dodd-Frank Act) Section 953 (b)은 대부분의 상장 기업들이 최고경영자-직원 임금 비율을 의무 공시하도록 하였다. 각 기업들이 임금 비율을 계산함에 있어 몇 가지의 재량적 방법을 사용할 수 있도록 허용하였고, 또한 필수적으로 공시해야하는 임금 비율 이외에 추가적으로 보충적 임금 비율을 공시할 수 있도록 하였다. 본 연구는 S&P 1500 리스트에 포함된 기업 중 2018년 1월부터 8월까지 최고경영자-중위 직원 임금 비율 자료를 공시한 1,125개의 기업을 대상으로 하여, 임금 비율을 공시함에 있어 보충적 임금 비율을 공시하는 동기에 대해 분석하였다. 구체적으로 기업들이 보충적 최고경영자-중위 직원 임금 비율을 공시함으로써 기업들의 이해관계자들에게 더 투명하게 임금 비율에 대한 정보를 제공하려 한 것인지 혹은 이해관계자들의 임금 비율에 대한 인식을 기회주의적으로 조정하려 한 것인지 연구하였고, 기업들은 두 가지 동기를 모두 고려하여 보충적 임금 비율을 공시한 것으로 나타났다. 또한, 기업들은 보충적 임금 비율 공시에 있어서 높은 임금 비율을 공시함에 따라 발생하게 될 정치적 비용과 필수적으로 공시하는 임금 비율보다 낮은 보조적 임금 비율을 공시함에 따라 발생하게 될 정치적 비용을 모두 고려하는 것으로 나타났다. 마지막으로 몇몇 기업들은 강한 토너먼트 유인을 부여한다는 신호를 경영자 노동 시장에 보이기 위해 필수적으로 공시해야하는 임금 비율보다 높은 보충적 임금 비율을 공시하는 것으로 나타났다.

주요어: 최고경영자와 중위 직원간 임금 비율, 보충적 임금 비율, 임금 비율 공시, 공시 동기

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